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UNITED STATES
DEPARTMENT OF THE INTERIOR
J. A. KRUG, SECRETARY

BUREAU OF MINES
R. R. SAYERS, DIRECTOR

INFORMATION CIRCULAR

SUMMARIZED STATISTICS OF PRODUCTION OF LEAD AND ZINC IN THE TRI-STATE (MISSOURI-KANSAS-OKLAHOMA) MINING DISTRICT

BY

A. J. MARTIN

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By A. J. Martin[2]

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[1] The Bureau of Mines will welcome reprinting of this paper provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Information Circular 7383."

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INTRODUCTION

The Tri-State, or Joplin, zinc and lead mining district in southwestern Missouri and adjoining parts of Kansas and Oklahoma is one of the great mining districts of the world. It is in flat-lying or gently rolling agricultural country near industrial centers and coal, oil, and gas fields. The nearly horizontally lying bedded rocks in which the ore bodies are found were originally limestone but are now largely chert containing minor percentages of dolomite and other minerals. The ore occurs in nearly vertical fissure zones, large and small, and in blanket (sheet-ground) deposits. The mining depth ranges from surface diggings to 450 feet. The average tenor of the ore mined in recent years is much lower than that of ore produced in other large zinc and lead districts of the United States. Mining and milling costs are low because of the shallowness of mining, amenability of ores to concentration, efficiency resulting from long experience of management and labor, and other factors. The operators comprise many small and medium-size producing companies and partnerships, as well as individuals and a few larger producers. About 7,000 men are employed in the mines and mills during normal industrial activity. The concentrates produced are sold f.o.b. the mill bins to local representatives of smelting companies at prices quoted on the Joplin market.

The productive life of the district began with the discovery of lead near Joplin in 1848, but output was not large until after mining for zinc began near Granby in 1871. In most of the intervening years through 1945 the district produced more zinc than any other field, and it generally ranked third or fourth in the United States in lead production. Figures compiled from sources given later in this paper show a total output for the district from the beginning through 1945 of 20,755,020 tons of zinc concentrates and 3,334,057 tons of lead concentrates valued altogether at $1,110,058,581 in the mill bins. The output, in terms of recoverable metals, was 10,609,408 tons of zinc and 2,529,121 tons of lead, valued in all, at the average yearly market prices of the metals, at $1,691,282,419. During the 39 years (1907-1945) for which complete figures are available, the annual output of the district fluctuated from 23 to 66 percent of the total United States mine output of zinc and from 5 to 18 percent of the total lead; the averages for the period were 40 percent for zinc and 11 percent for lead. The peak yearly production was attained in 1926, with an output of 423,800 tons of recoverable zinc and 102,117 tons of lead. Since that year the production rate has trended downward, accentuated at first by the depression in the thirties and later ameliorated somewhat under the stimulus of heavy demand and higher metal prices during World War II; the output in 1945 was 139,274 tons of recoverable zinc and 23,556 tons of lead.

The above figures show the great contribution made by the Tri-State district in the past toward the country's supplies of primary zinc and lead, especially zinc. However, the district's production is expected to decline both in quantity and in proportion of total United States mine output unless important discoveries are made. Ore exposed in mine workings and extensive exploratory drilling done in recent years within and without the productive

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areas indicate that, although the developed reserves of high-grade ore are no longer large, there are many millions of tons of low-grade rock left that would be commercial under conditions of high prices, large-scale mechanized mining, efficient labor, and the best metallurgical treatment methods. A considerable part of this potential ore is in and around old mines and in low-grade deposits in virgin ground, where it would be easily accessible at reasonable cost for use when metal prices are high or during a national emergency. A large part, however, is in floors, roofs, pillars, and edges of mined-out or currently worked ore bodies in areas where conditions are such that the ore, if left until after present operations cease and the mines fill with water and cave, would be costly to recover. The principal area of this type is in the Oklahoma-Kansas field, where there are about 15 square miles honey-combed by connected underground workings, nearly all of which must be kept unwatered and the roofs and pillars maintained in safe condition to enable mining to be done in any part. Water being pumped in this area alone amounts to about 14,000 gallons per minute. Should the price of concentrates decline to a point where many lower-grade mines would have to suspend operations, the shifting of the entire maintenance and pumping expense onto the remaining higher-grade mines would increase substantial the cost of production possibly to a level that would progressively close th whole area.

Despite the generally depleted state of the best ore reserves and uncertainty as to the nature and extent of the changes in operating and marketing conditions that will occur during the coming period of widespread readjustments from war to peaceful pursuits, there are several factors that warrant a feeling of confidence in the ability of the district to maintain a large mining industry for many years. The discovery and development of ore bodies has been facilitated greatly by intensive studies by geologists of the relationship of ore deposition to structural features, which permit identification of the ore-bearing beds. Mechanized mining was not used to an appreciable extent in the district until about 1938, and there have since been many improvements in adapting it to the Tri-State deposits. These new methods offer a promising means of extending the life of present productive areas and of reworking certain formerly important producing areas. Most of the operators and miners are men of long experience in the district and have shown remarkable ingenuity in exploiting low-grade ore bodies in competitic with higher-grade deposits in other districts. The drain upon ore reserves in other districts during World War II was heavy, also, and costs of production are known to have increased in some foreign countries. Certain smelting and manufacturing plants have long drawn upon the high-grade, relatively pure Tri-State concentrates for their raw material and can be expecte to prefer them in the future if the price is not disproportionate to that of ores from other sources. The owners of some of these plants operate mine in the Tri-State district and employ large exploration departments, which are an important factor in prolonging the life of the district.

A record of past production is helpful in the search for extensions of ore bodies and additional workable deposits in old mining regions. Most of the statistics given in this circular were compiled during World War II in

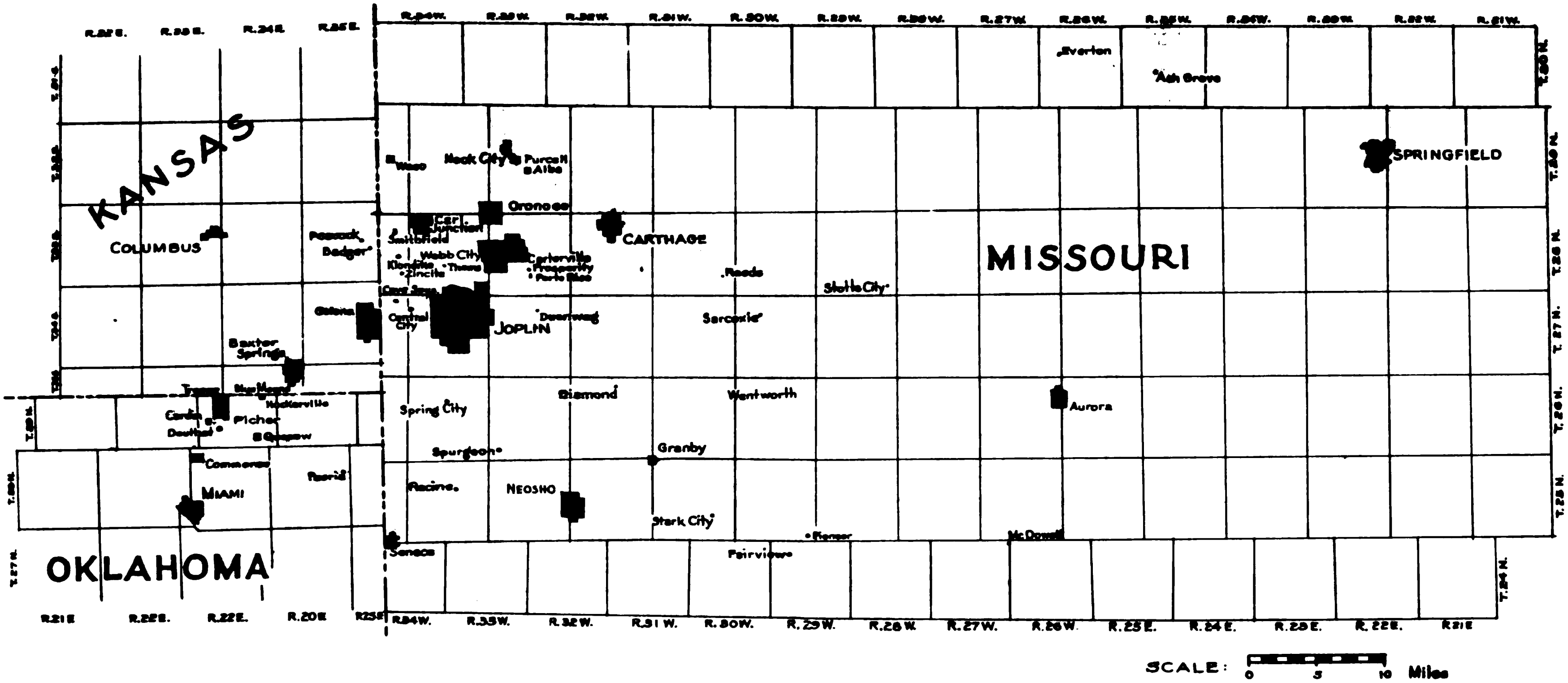

Figure I. - Index map of the Tri-State (Missouri-Kansas-Oklahoma) mining district.

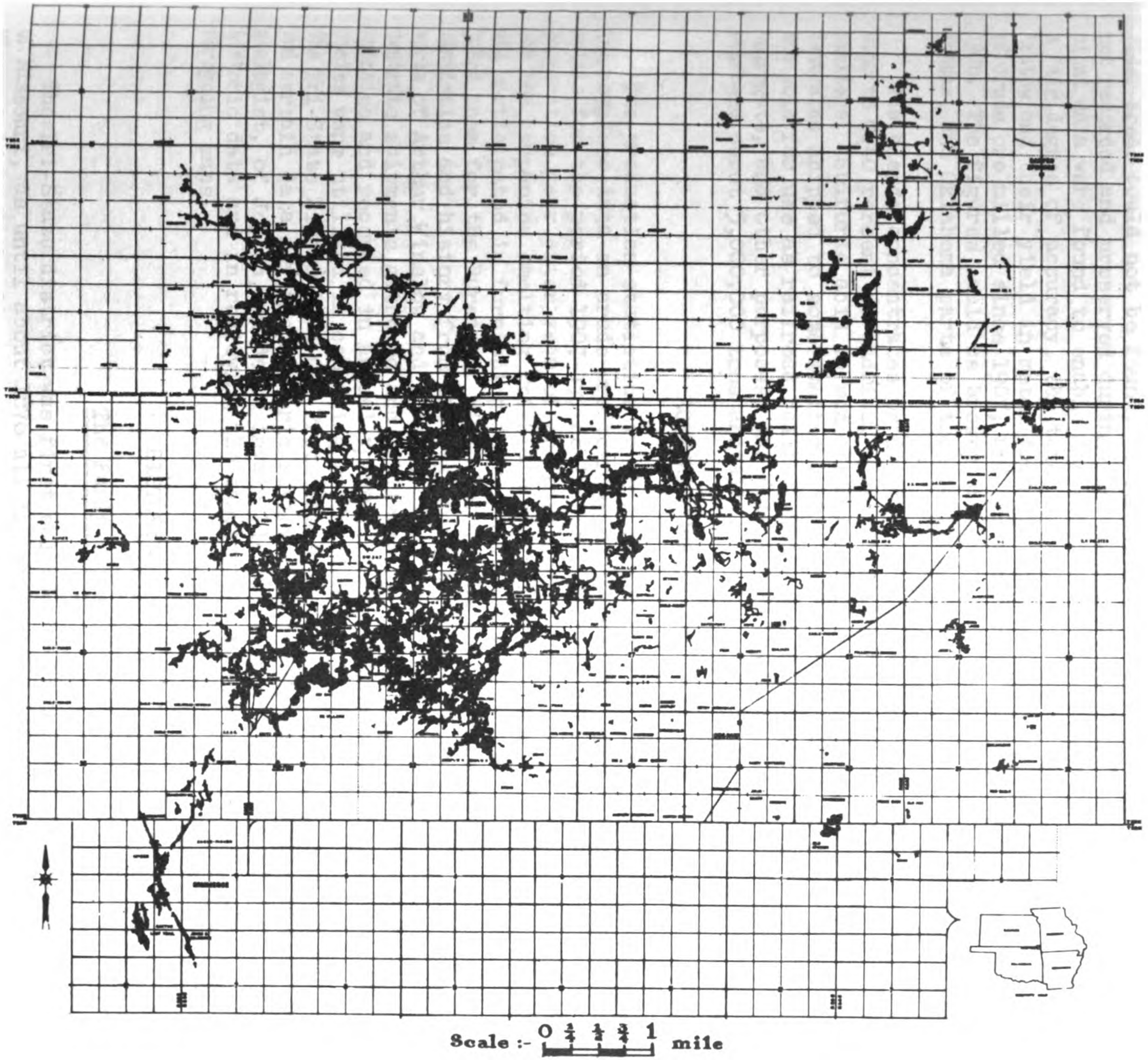

Figure 2. - Oklahoma-Kansas field, showing mine workings.

response to requests from engineers and geologists engaged in wartime prospecting in the Tri-State district. Tables showing the yearly production of each area or subdistrict are included. Complete production records for the older areas could not be found, as consecutive yearly figures by areas were not recorded and preserved during the early years of mining. However, sufficient data were found to enable the compilation of statistics showing, with a fair degree of accuracy, the total Tri-State district production of concentrates and their yield in metal from the beginning through 1944, the quantity of crude ore milled since 1907, and the quantity of old tailings milled since 1926. The figures could be broken down to show the portion from the Missouri, Kansas, and Oklahoma parts of the district, also.

The blende concentrates produced in the Tri-State region usually contain 0.30 to 0.40 percent of cadmium, some of which is recovered as a byproduct at smelters. Sulfuric acid is made from gases driven off in roasting the concentrates shipped to some smelters. Large tonnages of chat (mill tailings) are sold for use as railroad ballast, road-surfacing material, concrete aggregate, and other purposes; the quantity shipped in recent years has averaged about 5,000,000 tons annually.

ACKNOWLEDGMENTS

The production statistics in this circular, and especially those giving complete data on crude-ore tonnage and output in terms of recoverable metals for the period 1907-45, could not have been obtained without the cooperation year after year of the mine operators of the Tri-State district and the companies smelting Tri-State concentrates. Thanks are due to all who participated in furnishing these data, and to J. P. Dunlop, who compiled them for the Bureau of Mines before the author succeeded him. The statistics and history from the beginning to 1893 were obtained from the works of Arthur Winslow and others, cited later in this paper. Data on concentrate shipments gathered and published by Joplin newspapers and reporting agencies and recorded in annual volumes of Mineral Resources of the United States were utilized in compiling production for the years 1894 to 1906. The Tri-State Zinc & Lead Ore Producers Association furnished photographs and certain data for the historic review. George M. Fowler, consulting geologist, of Joplin, rendered invaluable assistance in the search for historic data and in reviewing the manuscript; he also contributed the foregoing maps.

HISTORY

The Early Years

The Tri-State district was first called the Southwestern District of Missouri, as until about 1876 all the producing mines were in the Missouri part of the district. After mining extended across State lines into Kansas and Oklahoma, the region was variously called the Missouri-Kansas, Joplin, and Missouri-Kansas-Oklahoma district. Since about 1917, however, it has been generally known as the Tri-State zinc-lead mining district, although Joplin district is still a common designation. The statistics given in this circular cover production from Barry, Christian, Dade, Greene, Hickory, Howell, Jasper, Lawrence, Newton, Taney, and Wright Counties in Missouri, Cherokee County, Kansas, and Ottawa County, Oklahoma.

The first part of the historical review that follows (1850-1893) was extracted from chapter 7, volume 6, of the Report on the Lead and Zinc Deposits of Missouri, by Arthur Winslow, published by the Missouri Geological Survey in 1894; the rest is based upon historic reviews of lead and zinc mining in Kansas, southwestern Missouri, and Oklahoma, respectively, by J. P. Dunlop, in Mineral Resources, 1914 (Pt. I, pp. 49-51, 72-78, and 106-110), and in subsequent annual reviews (also by Dunlop, for the years 1915-39) in Mineral Resources and Minerals Yearbook.

Lead ore was discovered in Jasper County, at Leadville, in 1848, and further discoveries were made at Joplin the following year. About 1851, mining was begun on Center Creek near what was later called Minersville and what is now Oronogo. Up to 1854, these deposits had yielded only 200 tons of galena, but in that year alone they produced as much again. Swallow[3] describes the Mineral Point, Mosley, and other mines on Turkey Creek, a littl northeast of Joplin, as in operation in 1854 and producing several hundred tons a year.

Discoveries were also made in Newton County, and the developments there in these early years were greater than in Jasper County. In 1850, the Prairi diggings, 1 mile south of Granby, were started. In the same year Mosley and Oldham are said to have raised 50 tons of ore on Shoal Creek, 5 miles northwest of Neosho. In 1854, Swallow[4] wrote that there was not a cabin at Branby and only one shaft had been sunk. Up to that time the total production of Jasper and Newton Counties was 862 tons of lead. This had been produced mostly from galena, though some carbonate was smelted. The zinc ore was thrown aside. By 1857 mining was actively under way at Granby, and in that year Blow and Kennett erected a furnace and smelted 800 tons of ore from February to September. In 1858 Swallow estimated that probably 4,000 tons of lead had been produced to date. Between 1851 and 1860, it is estimated that some 300 shafts were put down at various diggings in and about Granby, besides many more at other places in the county.

Along with development of these two counties, mining was also in progress in other parts of the southwest. About 1856, Shumard[5] notes that small quantities of lead were mined in Wright County and considerable quantities in Webster County. In Christian County (then a part of Taney, Webster, and Greene Counties), there were also quite a number of diggings.

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[3] Swallow, G. C., The First and Second Annual Reports of the Geological Survey of Missouri, Jefferson City: Pt. I, 1855, p. 160.

[4] Swallow, G. C., Geological Report Along the Line of the Southwestern Branch of the Pacific Railroad, State of Missouri: St. Louis, 1859.

[5] Meek, F. B., and Shumard, B. F., Report on the Geological Survey of Missouri, 1855-71: Jefferson City, 1873, p. 239.

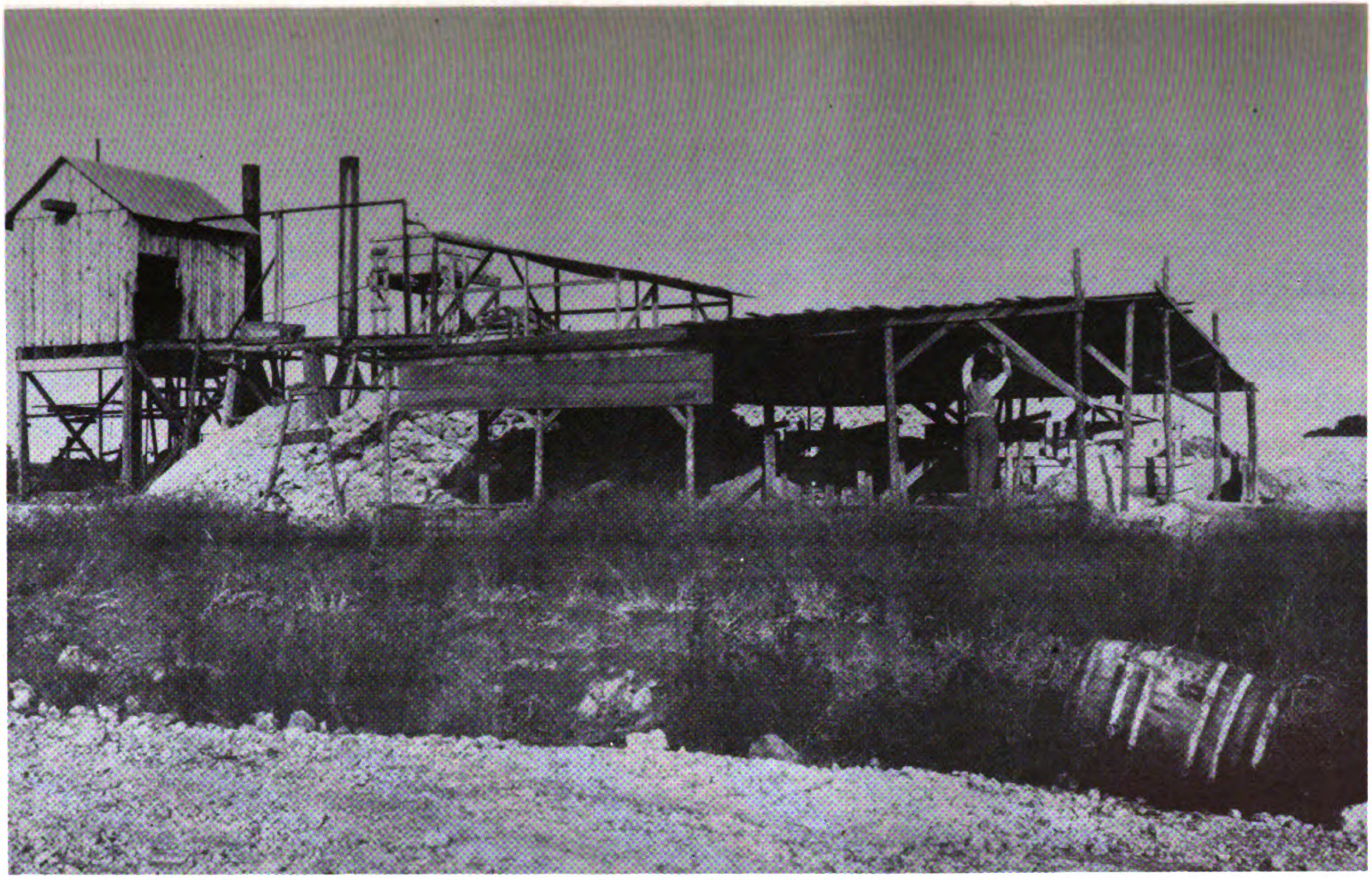

Figure 3. - An early-day mine plant and hand jig concentrator in the Tri-State district.

Smelting in Early Days

The first Scotch hearth in southwestern Missouri was built in 1851 and started early in 1852. It was constructed by G. W. Mosley & Co., in Newton County, near the mouth of Cedar Creek, about 6 miles northwest of Neosho. The ore smelted was from the Mosely mine and from Oliver's Prairie, in Newton County, and from Center Creek and Turkey Creek, in Jasper County. In 1853, the Harklerode furnace was built on Center Creek, about 5 miles north of Joplin. Ore from both Jasper and Newton Counties was smelted here. The total amount of lead than produced by log furnaces and Scotch hearths between 1850 and 1854 was estimated by Swallow to have been 776 tons.

New discoveries and extensive developments soon led to the erection of other smelters. The most noteworthy of these were at Granby, where Kennett & Blow, in 1856, erected 6 Scotch hearths. Six other hearths were built and operated by others. The production of Granby rapidly rose to 4,000 tons of lead per year. In Christian County, the furnace owned by Price & Bray on Bull Creek was also in operation in 1857. The lead was hauled long distances in wagons to the markets or to river points. Some went as far north as Boonville, on the Missouri River, and a large quantity was hauled to Linn Creek, on the Osage River, and another large portion was hauled to Fort Smith, on the Arkansas River, and then transferred by boat to New Orleans, St. Louis, and other markets. Swallow stated that the usual cost of transportation from the furnace to St. Louis at this time was $1.25 per 100 pounds.

During the Civil War, mining in southwestern Missouri stopped entirely at times, though the Granby mines and furnaces were worked alternately by the Confederate and Federal forces. The decrease in lead production, combined with the great consumption, had an immediate effect upon prices. In 1860, lead was quoted in St. Louis at 4.25 cents per pound; in 1862, it had risen to 6.50; in 1863, to 8.625; and in 1864, it rose to 12.80. In 1865, it was as high as 10 cents, and by 1870 had only fallen to 7.25 cents. With the cessation of the war, mining was resumed vigorously.

In 1865, Henry T. Blow obtained a lease of the Granby mine and started mining at once. About this time a few other mines in adjoining counties resumed work. The St. Louis & San Francisco Railway, which had its western terminus at Rolla for a number of years after 1860, was pushed westward again during this decade, reaching Lebanon in 1869 and Springfield in 1870. This was in itself a strong incentive to the development of mines in the whole of southwestern Missouri.

Opening of the Joplin Area

Mining near the present site of Joplin was not extensive until 1870. In August of that year J. B. Sargent and E. R. Moffett discovered lead ores in large quantity within what are now the city limits. The Moon diggings, on East Joplin hill, were first opened about the same time. The development of these ore bodies became at once active, and by 1871 several furnaces were kept running night and day to smelt the ores. In 1871 Patrick

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Murphy bought tho land on which Joplin now stands, and the town, first called Murphysburg, was laid out. Discovery succeeded discovery in and about Joplin, along Joplin Creek, Center Creek, (Oronogo) and Turkey Creek. Thus, by 1874, the population of Joplin had reached 5,000; some 1,000 miners were employed, production was as much as 200 tons of galena per week, and 7 Scotch hearths and 6 reverboratory furnaces were in operation. In the same year the Memphis, Carthage & Southwestern Railway, now part of the St. Louis & San Francisco, was built. In 1875, the Webb diggings on the present site of Webb City yielded about 25 tons of ore per week. In 1876, Carterville was platted, and mining was begun by the Carterville Mining & Smelting Co. on ground that later proved very productive.

In 1871, an agent of the Missouri Zinc Co. began to work for zinc near Granby. The first zinc ore is reported to have been shipped from Joplin to La Salle in 1872 and found sale at once, though at a low figure, beginning at $3 per ton but soon rising gradually to $15. In 1873, zinc smelting was started at Weir City, Kansas. Dade County also became a producer of zinc ores at this time, and miners in Greene County shipped a little. Thus, by 1875, the production of the State had risen to 23,500 tons of this ore. The discovery and development of the deposits at Galena, Kans., near Joplin, in 1877, gave an additional impetus to mining, whereas the sale of ores was further facilitated by the erection, in 1878, of zinc works at Pittsburg, Kans., by R. Lanyon & Co.

The discovery of the Joplin lead ores first drew miners away from Granby, but utilization of zinc ores later caused their return, and brought about not only a renewal of mining operations but an entire change in the character of the work. Exploitations became deeper and larger, though still somewhat crude. Up to 1873, fully 1,200 shafts had been sunk about Granby; about Neosho there were perhaps 100 more. Of these, only a very small number were operating at any one time. In 1874 some mining was in progress in Barry County. In 1875 the Dade County Mining & Smelting Company began work at Corry and during the year shipped 149 tons of lead ore. In 1870 the Frisco Railway was completed to Pierce City and early the next year was extended beyond the State line.

The 1880-1893 Period

From 1880 to 1893 constituted a period of prosperity in the zinc and lead mining. The production of zinc ore again more than trebled, and that of lead ore increased materially, notwithstanding the fact that during this whole period the price of lead in St. Louis reached 5 cents only once or twice and frequently was below 3 cents per pound. Similarly, the price of spelter in New York varied from a little over 4 cents to about 5.5 cents per pound. In the early eighties, the industry was less active than later. During the period new ore bodies were developed, especially in Jasper County. About 1880, the St. Louis & San Francisco, the Missouri Pacific, and the Kansas City, Fort Scott & Memphis Railways were extended into this County. Mining was vigorously prosecuted, and production soon surpassed tha of Newton County. Camps multiplied about Joplin, and in the comparatively new ground of Carterville and Webb City, along Spring River, Center Creek, and Turkey Creek, and especially about Galena, across the State line in Kansas. The mines were so numerous and the opening controlled by one operator changed hands so often that a specific reference to the history of each, even of the larger, is not practicable. The mines gradually grew in size as ore bodies were followed, especially about Carterville and Belleville. By 1890, the population of Joplin had grown to 10,000, that of Webb City and Carterville to 8,000, and that of Carthage to 8,000 also. In 1892, Jasper County produced over 100,000 tons of zinc ore, which was more than three-fourths of the total production of the State; and over 11,000 tons of lead ore, which was nearly one-fourth of the State's production. Early in 1886 the mines at Aurora, in Lawrence County, began to be developed, and by 1889 they became important producers. Other southwestern counties also were producers of both lead and zinc during this period, especially Greene and Christian Counties.

Zinc-smelting plants were erected in 1881 at Rich Hill (Bates County, Missouri) and West Joplin. In 1882 four plants were in operation at Pittsburg, Kans., one at Weir City, Kans., and one at Joplin. In 1887, zinc works were started at Nevada, Mo., and new works were being built at Scammonville and Girard, Kans. In 1892 a plant was built at Galena, Kans.

Steam power was in common use at the mines by 1893, but horse and man power were widely used. The shafts were roughly excavated and poorly timbered, and the rope and bucket were in almost universal use. Steam crushers, rolls, and other important machinery had been introduced in some of the mills. The system of subleasing small tracts of land prevailed, but a few owners operated the lands themselves systematically on a large scale. Royalties ranging up to 25 percent on blende and 50 percent on galena were paid to some of the land owners, and, where pumping was done, there was an additional tax of $1 per ton of zinc ore and $2 per 1,000 pounds of lead ore. In general, royalties were higher than this, the amount paid depending on the ease of mining and the quantity of ore available.

Early Developments in Oklahoma

Although the history by Winslow covered the period 1850-93, it did not mention mining in the Oklahoma area, which began in a small way at Peoria in 1891. The Peoria camp, however, did not become an important producer. At Galena, Kans., lead production reached its peak in 1897 and zinc in 1898; the peak for lead concentrates was 15,185 tons and for zinc concentrates 74,852 tons. In 1898, the Badger-Peacock camp was developed, and in 1900 the Lawton camp was prospected but did not attain prominence as a producing camp until about 10 years later. Production in southwestern Missouri continued to increase until it reached the peak in 1916, when the output of lead concentrates was 40,844 tons and zinc concentrates 302,675 tons. The number of men employed at mines and mills in southwestern Missouri in 1915, according to the report of the State mine inspector, was 9,463, and the average daily wage was $3.49.

The first shaft in the Quapaw area of Oklahoma was sunk in 1904, and this area contributed a substantial output of lead and zinc during the next few years. After the discovery of the deposits near Hattenville, now called Commerce, in 1905, and the beginning of mining and milling there in 1907, production of both lead and zinc in the Oklahoma area rose rapidly. By 1913 development and drilling had extended to the north of Commerce as far as the Kansas State line. In 1914 and 1915 much drilling and development were done, and more new territory was opened. The town of Commerce more than doubled in population and property values, and new towns called Cardin and Picher came into existence. In 1916 great activity in drilling, development, and erection of concentrating plants continued in the Commerce, Picher-Cardin, and Quapaw areas, and drilling was being done across the State line in the Baxter Springs-Blue Mound area in Kansas. The increased demand for zinc during World War I hastened development of the newly found mines. Transportation conditions were improved by completion of the Oklahoma, Kansas & Missouri Interurban Railway (name later changed to Northeast Oklahoma Railroad) from Commerce through Century, Cardin, and Picher to the Kansas State line. The Mineral Belt line from Quapaw to Century, Cardin, and Picher was nearly completed, and a year later the Southwestern Missouri Electric Railway was extended from Galena, Kans., to the Hockerville and Picher camps. In 1917 output continued to expand in the Oklahoma-Kansas field, and the Kansas part of the Waco district became productive. In southwestern Missouri, however, where the crude ore in many mines yielded only 2 to 2.75 percent combined zinc and lead in concentrates, the high operating costs and decline in price of concentrates made mining at those properties unprofitable. Development in the "sheet ground" areas ceased entirely. Many of the mills were closed and moved to mines in the Oklahoma area. In 1918 production in the Oklahoma-Kansas or "Picher" field far exceeded that in the old Missouri field, and after 1919 the bulk of the output of the Tri-State district came from the new field. However, the rise in concentrate prices during World War II led to an increase in the output of southwestern Missouri and some parts of the Kansas area, but production in the Oklahoma area decreased sharply after 1941.

Peak Production

The peak production of concentrates in the Oklahoma-Kansas field was 868,499 tons (combined zinc and lead) in 1926. In that year the total district output also reached the peak, totaling 956,319 tons. The highest yearly value of the district output was $57,321,173 in 1925, when prices of concentrates were higher than in 1926. In 1932, during the depression, the concentrate production of the district (zinc and lead) dropped to 193,228 tons, the lowest in 36 years. By 1937 it had risen to 512,655 tons, but it later declined and was 290,845 tons in 1945. Depletion of the large reserves of high- and medium-grade ores necessitated the mining of much low-grade ore during World War II to maintain production at a high rate. The average recovery of combined zinc and lead concentrates from the crude ore decreased from 6.12 percent in 1940 to 3.71 percent in 1944, and 3.36 percent in 1945, and the average price per ton of concentrates (including the Government bonus in 1944 and 1945) rose from $43.67 in 1940 to $105.97 in 1944 and $111.25 in 1945.

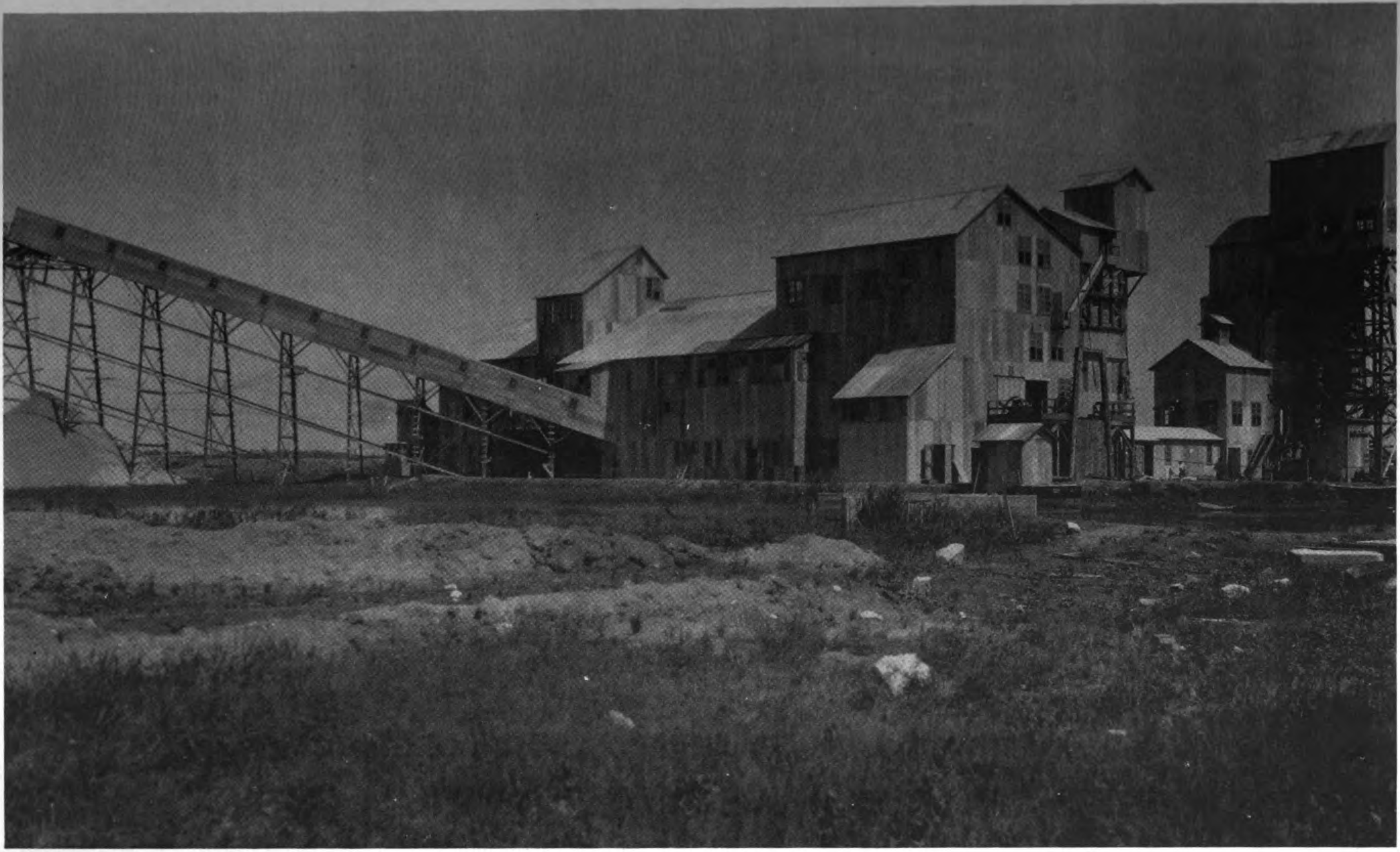


Figure 4. - Tri-State mill-shaft headframe and mill of the early 1920's.

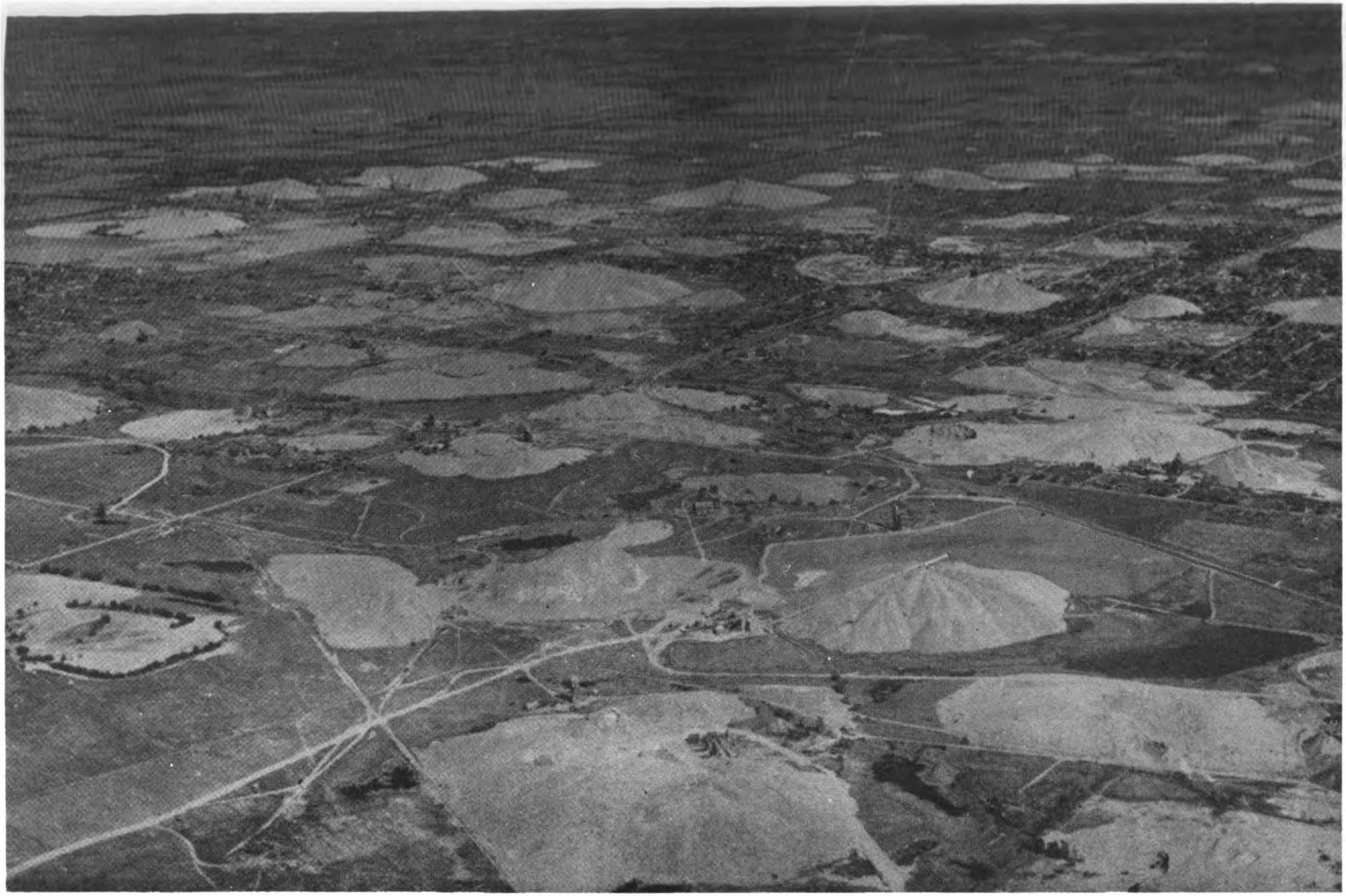


Figure 5. - Aerial photograph of portion of Tri-State zinc and lead mining field, about 1929. (Right center is city of Picher.)

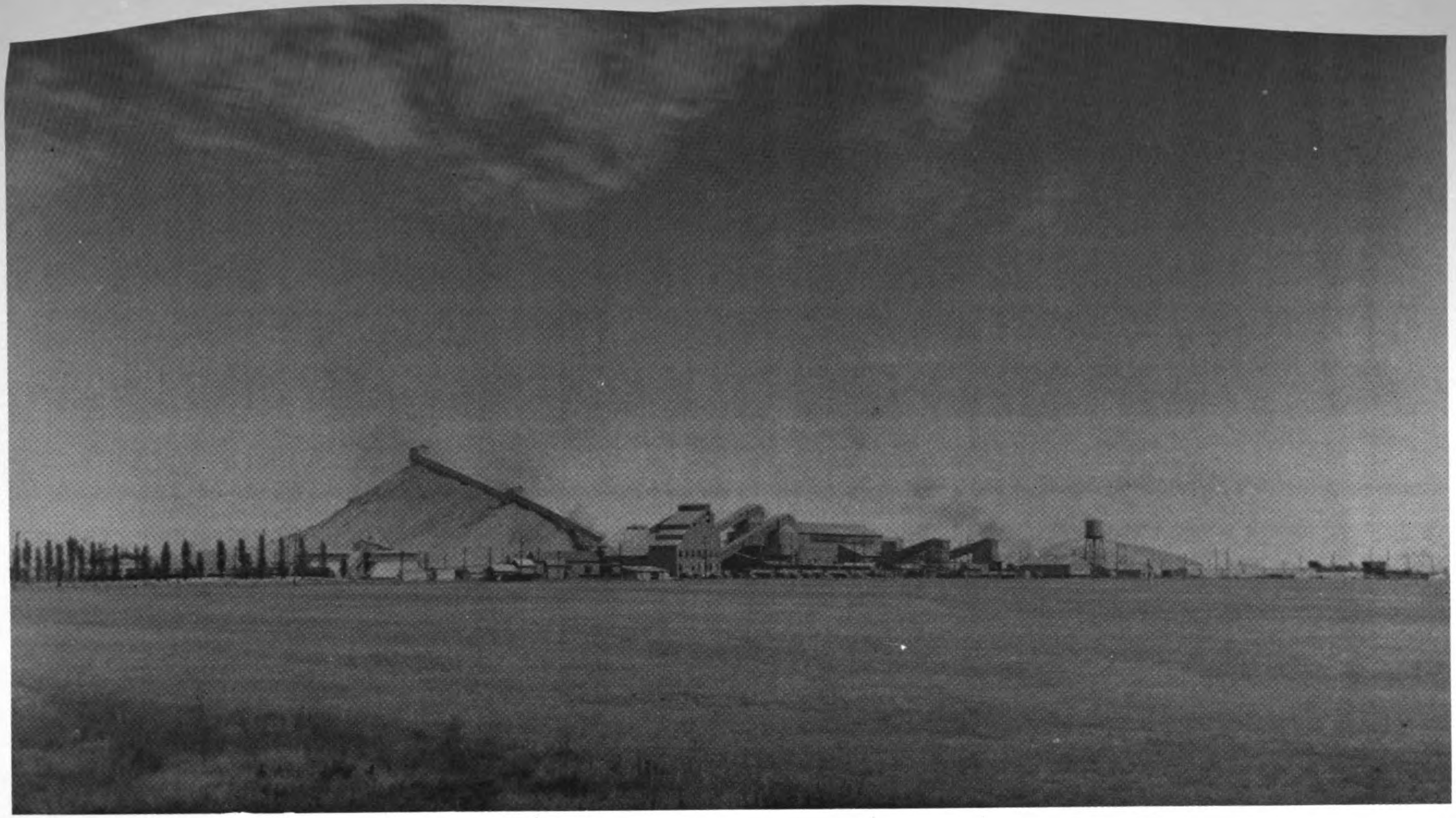


Figure 6. - Eagle-Picher central mill, Cardin, Okla., 1943. (Capacity, 14,000 tons daily.)

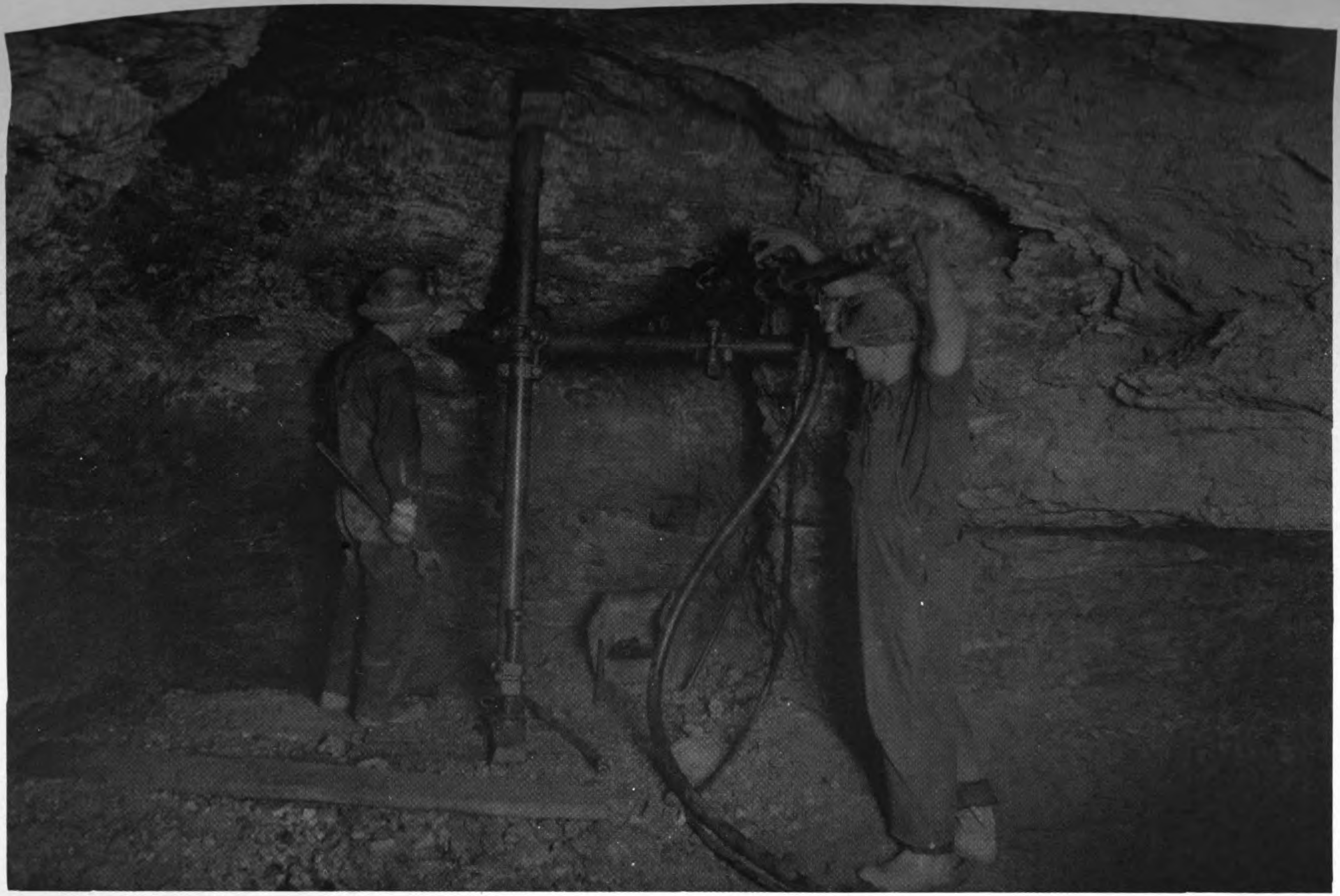


Figure 7. - Drilling drift face in Tri-State mine, 1937.

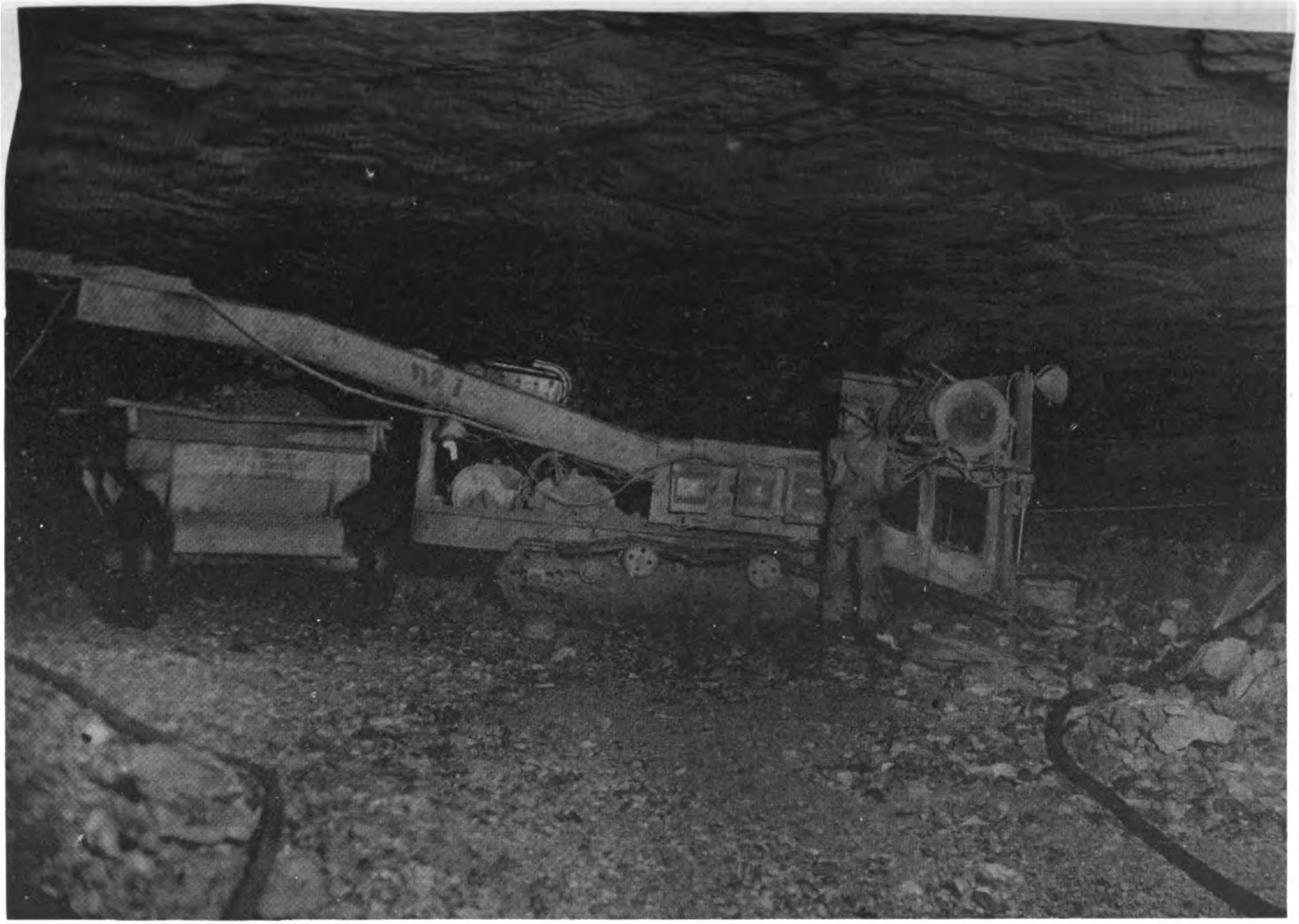


Figure 8. - Caterpillar-mounted scraper-loader and storage-battery-powered dump truck used in some Tri-State mines since 1941. (Ore is hauled to shafts and dumped into chutes, from which it drops into cans or skips for hoisting.)

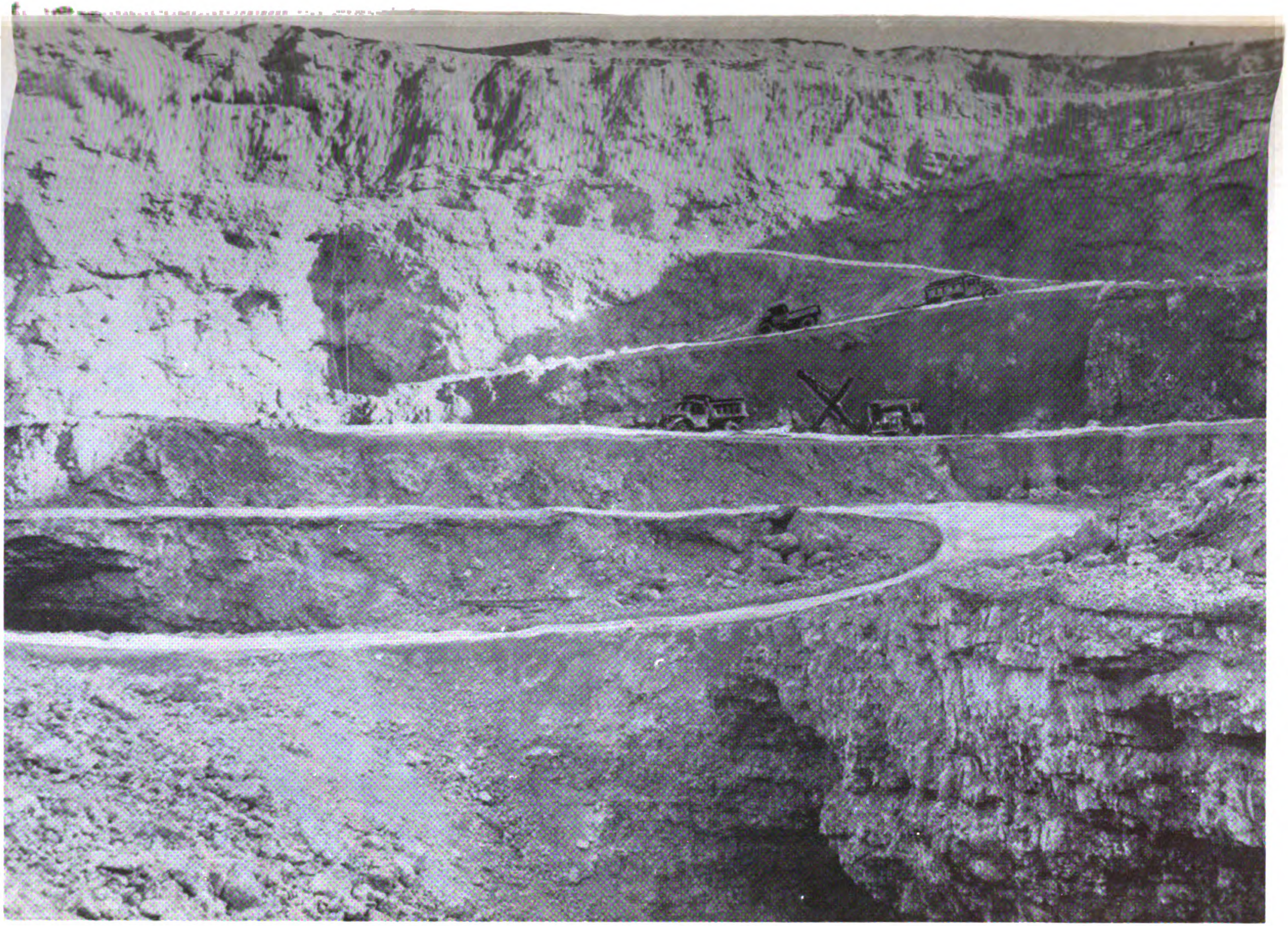


Figure 9. - Oronogo Circle open-pit mine, November 1941. Pit is 230 feet deep.

In general, the ore in the Kansas-Oklahoma field was richer than in the old Joplin-Webb City area but was also more refractory to treatment. Tailing losses in the old Joplin type of mill, consisting of crusher, rolls, jigs, and tables, are said to have run from 30 to 40 percent of the zinc in the ore. About 1915 experiments in the use of the flotation process for saving some of the zinc going to waste in the fine material were begun in some of the mills, and by 1924 flotation had become an important part of the recovery process. Since 1939 a large tonnage of ore has been treated by the differential-density (sink-and-float) process; the enriched product resulting from treatment by this process is concentrated further by jigging and flotation. The plant using this process had a capacity of 14,000 tons daily at the end of 1945. The capacity of the other 36 mine mills operating at that time ranged from 100 to 2,000 tons and averaged 600 tons, and that of 16 tailing mills ranged from 800 to 4,000 tons and averaged 2,200 tons. The district annual average combined mining and milling cost per ton of mine rock (excluding depletion and depreciation) from 1923 to 1926, inclusive, ranged from $2.03 to $2.10 and averaged $2.06, according to figures of the Tri-State Zinc & Lead Ore Producers Association published in the annual review number of the Joplin Globe in January 1927. Comparable costs compiled by the Association for succeeding years showed a decline to $1.30 in 1932 and increases to $1.90 in 1937, $1.91 in 1941, $2,48 in 1943, $2.57 in 1944, and $2.74 in 1945.

Mechanization of underground loading and haulage in the Tri-State district did not get well under way until about 1937, although power shovels were being used in some Webb City mines in 1908. Scarcity of labor during World War II necessitated the use of labor-saving machinery wherever possible, and by the end of 1943 nearly all the mines used mechanical loading and haulage equipment, and some mines had begun to use jumbo drill holders in drilling ore for breaking underground.

From 1926 through 1945 a considerable part of the production of zinc was derived from retreating old tailings. The total quantity retreated (including tailings rerun more than once) during this period was 129,564,495 tons yielding 1,215,885 tons of zinc concentrates and 10,055 tons of lead concentrates, valued in all at $53,870,244. The quantity of old tailings remilled before 1926 is not recorded, but the output of concentrates from this source was comparatively small and was included in the production figures for crude ore.

Marketing of Concentrates

The method of marketing the mine output of the Tri-State district adopted in the early days of mining continued through 1945. It differs from that employed in the Western States, where the producer receives pay for ore upon the basis of the assay content of metal at a certain price per unit f.o.b. smelter, and freight charges are deducted from the smelter settlement if not paid in advance or guaranteed by the shipper. In the Tri-State region the producer is paid by the ton of concentrates, which are purchased outright at the mine. Hauling and freight charges are paid by the smelter. Buying zinc blende concentrates on an assay basis became general in 1899, though it began in a small way a few years earlier. Formerly the ore was bought on "flat bid"; that is, the buyer made a visual inspection, estimated the metallic contents, and then offered so much per ton for the particular concentrates in question. A large part of galena concentrates continued to be bought on flat bid for many years after 1899. Concentrate prices at Joplin are quoted on the basis of 60 percent zinc content for zinc blende concentrates and 80 percent lead for galena concentrates. Corrections to base prices are applied upon a sliding scale determined by the assay content and the amount of impurities (generally iron and lime) in the concentrates. Prices for zinc carbonate and silicate were quoted on the basis of 40 percent zinc content when there was a sizable output of this type of concentrate, but the output has been small since 1924, and sales were made largely on contract or lot quotations by individual buyers. For the period 1907-45, carbonate and silicate concentrates comprised only about 2 percent of the total zinc concentrates and 0.41 percent of the lead concentrates.

Zinc and Lead Smelters

Most of the lead concentrates produced in the Tri-State district have been sold to smelters at Granby, Joplin, Webb City, Galena, and near Picher, although a considerable tonnage has been shipped to smelters outside the district. Only the smelter at Galena has been in operation in recent years the last smelter to operate in Joplin was converted in 1929 for the manufacture of lead products, and the smelters at Granby, Webb City, and near Picher have been dismantled.

The zinc concentrates have been shipped to smelters in various Central and Eastern States. In 1894, according to the Annual Report of the Missour State Mine Inspector, concentrates were shipped to smelters at Pittsburg, Kans.; Peru, Ill.; LaSalle, Ill.; St. Louis, Mo.; Girard, Kans.; Weir City, Kans.; Marion, Ind.; Waukegan, Wis.; Joplin, Mo.; Collinsville, Ill.; Rich H Mo.; Mineral Point, Wis.; and Winona, Ill. Zinc smelters were built after 1894 in the natural gas belt of Kansas and Oklahoma, at Altoona, Bruce, Caney, Chanute, Cherryvale, Dearing, Gas, Iola, LaHarpe, and Neodesha, in Kansas, and Blackwell, Bartlesville, Collinsville, Quinton, Sand Springs, and Henryetta in Oklahoma, and also at Fort Smith and Van Buren, Arkansas. The Empire Zinc Co. smelter at Joplin ceased operating in June 1900.

In 1928, according to the Tri-State Zinc & Lead Ore Producers Association, the zinc concentrates went to smelters or oxide plants at Donora, Pa. Cherryvale, Kans.; Blackwell, Okla.; Danville, Ill.; Henryetta, Okla.; Fort Smith, Ark.; Quinton, Okla.; Hillsboro, Ill.; Bartlesville, Okla.; East St. Louis, Ill.; Moundsville, W. Va.; Peru, Ill.; Grasselli, Ind.; LaSalle, Ill.; Caney, Kans.; Cleveland, Ohio,; Depue, Ill.; Coffeyville, Kans.; Niles, Ohio; Collinsville, Ill.; and Lockland, Ohio.

In 1943-45 concentrates were shipped to Henryetta, East St. Louis, Bartlesville, Donora, Danville, LaSalle, Moundsville, Fort Smith, Hillsboro, Van Buren (Ark.), Coffeyville, and Meadowbrook (W. Va.).

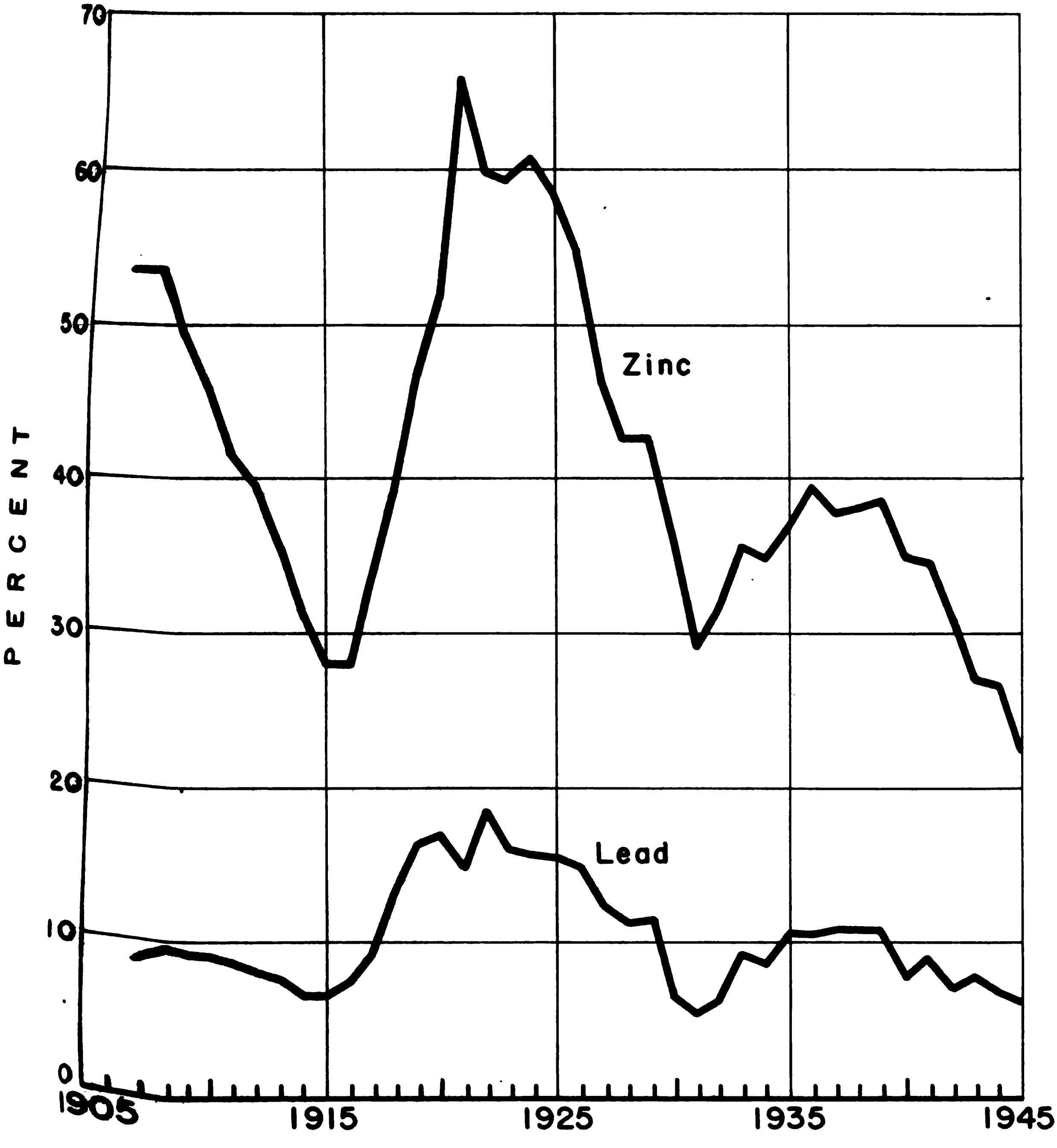
SOURCE OF STATISTICS

In assembling data on the total production of lead and zinc in the Tri-State or Joplin district, it was found that the three principal sources of statistics covered different periods, namely, 1850-1893, 1894-1906, and 1907-1943. Figures for Missouri during the first period were recorded by Arthur Winslow in Lead and Zinc Deposits of Missouri, Missouri Geological Survey volumes 6 and 7, published in 1894. These figures give the total Missouri production of lead and zinc by counties and periods from the beginning through 1893. The figures used herein to represent production of the Missouri part of the Tri-State district are those given by Winslow for Jasper, Newton, Lawrence, Barry, Christian, Dade, Greene, and Wright Counties. Winslow also presented data on production in Kansas, which, with figures published by Haworth, Erasmus, and others in History, Geography, Geology, and Metallurgy of Galena-Joplin lead and Zinc, Kansas University Geological Survey volume 6, 1904, supplied production figures for the Kansas part of the district from the beginning (1876) through 1893, except those for lead for the years 1881-83 and 1885. It was possible to make satisfactory estimates of lead production in those years through recorded production in the other years and a review of current literature of that period. The metal content of the Kansas ores for the period 1876-93 is based upon the average used by Winslow for Missouri (vol. 7, p. 506). The metal prices used for Kansas for the period 1876-79 are averages used by Winslow for Missouri; for the period 1880-93 they are yearly averages of the monthly average of the highest and lowest monthly quotations for common metal compiled from annual volumes of Mineral Resources, 1882-1893.

For the second period, 1894-1906, statistics on ore shipments were collected and published by various newspapers and reporting agencies in Joplin. The figures in this paper are based on those recorded by the United States Geological Survey in annual volumes of Mineral Resources, which credit as sources of data for individual years the Joplin Mining News, Joplin Herald, Joplin Daily Globe, and Jesse A. Zook of Joplin. The figures published during this period did not give the metal content of the ore or concentrates, as Winslow did for the first period, but later volumes of Mineral Resources gave composite assays of the blende concentrates shipped during the years 1897-1906, made by W. W. Petraeus, of Joplin. By using the assays for 1897-1906 and the assay for 1897 for the three preceding years, the approximate metal content of the concentrates could be calculated. The factor used in calculating the recoverable metal content of the lead concentrates for the entire second period was 74.5 percent, the arithmetical average of the weighted averages for the 14-year periods immediately preceding and following the period 1894-1906.

In calculating metal content of the zinc concentrates from the composite assays, allowances were made for losses in smelting and for slightly lower average assays resulting from inclusion of comparatively small quantities of silicate and carbonate, comparable to allowances during the period 1907-10, the first 4 years for which figures on recoverable metal were published in Mineral Resources. The value of the recoverable metal for the second period is calculated at the average of the monthly average prices based upon the average of the highest and lowest prices of common metal published in Mineral Resources 1900, 1905, and 1906.

All figures for the period 1907-1945 were compiled from annual volumes of Mineral Resources and Minerals Yearbook. The figures were obtained direct from the mine operators by annual canvass made by representatives of the United States Geological Survey for the years 1907-23 and by the Bureau of Mines for the remainder of the period.



Graph 1.- Percentage of United States mine production of zinc and lead in the Tri-State district, 1907-45.

SUMMARY PRODUCTION TABLES

Mine production of recoverable zinc and lead in the Tri-State District and the United States and percentage of United States production contributed by the Tri-State district, in terms of recovered metals, 1907-45

Year	Tri-State district, short tons		United States, short tons		Tri-State district percentage of U. S. production	
	Zinc	Lead	Zinc	Lead	Zinc	Lead
1907	135,824	31,524	253,017	364,715	53.7	8.6
1908	125,537	31,582	234,064	330,237	53.6	9.6
1909	148,990	35,145	302,373	385,113	49.3	9.1
1910	148,803	34,121	324,444	382,692	45.9	8.9
1911	137,633	35,745	331,515	426,585	41.5	8.4
1912	152,465	35,197	385,621	442,126	39.5	8.0
1913	146,474	36,468	413,824	483,113	35.4	7.5
1914	131,085	32,476	415,774	504,769	31.5	6.4
1915	164,544	34,351	588,060	542,098	28.0	6.3
1916	196,596	44,315	703,169	601,392	27.9	7.4
1917	238,768	57,815	713,556	628,464	33.5	9.2
1918	247,516	74,609	636,091	562,402	38.9	13.3
1919	257,514	69,861	548,846	429,589	46.9	16.3
1920	305,290	84,317	587,524	496,814	52.0	17.0
1921	169,211	61,581	256,640	414,491	65.9	14.9
1922	282,078	87,771	472,032	477,633	59.8	18.4
1923	361,655	86,787	610,690	547,217	59.2	15.9
1924	387,449	92,110	637,977	596,068	60.7	15.5
1925	416,943	105,372	710,847	684,439	58.6	15.4
1926	423,800	102,117	774,563	683,917	54.7	14.9
1927	330,530	81,686	718,541	665,489	46.0	12.3
1928	297,020	70,086	695,170	632,977	42.7	11.1
1929	309,436	74,143	724,478	654,331	42.7	11.3
1930	216,961	36,972	595,425	558,313	36.4	6.6
1931	119,168	21,463	410,318	404,622	29.0	5.3
1932	90,660	18,131	285,231	292,968	31.8	6.2
1933	137,054	25,137	384,280	272,677	35.7	9.2
1934	153,092	24,465	438,726	287,339	34.9	8.5
1935	191,136	34,849	517,903	331,103	36.9	10.5
1936	226,857	38,842	575,574	372,919	39.4	10.4
1937	236,585	50,274	626,362	464,892	37.8	10.8
1938	196,174	39,400	516,703	369,726	38.0	10.7
1939	224,446	44,176	583,807	413,979	38.4	10.7
1940	232,437	35,311	665,068	457,392	34.9	7.7
1941	258,837	41,080	749,125	461,426	34.6	8.9
1942	237,936	34,341	768,025	496,239	31.0	6.9
1943	200,514	34,722	744,196	453,313	26.9	7.7
1944	190,270	28,059	718,642	416.861	26.5	6.7
1945	139,274	23,556	614,358	390,831	22.7	6.1
Total	8,566,562	1,929,957	21,232,559	18,381,271	40.3	10.5

Mine production of lead and zinc in the Tri-State (Missouri-Kansas-Oklahoma) district, 1850-1945

Year	Crude ore treated, short tons	Old tailings treated, short tons	Concentrates[1]				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1850-59	[2]		25,485	$1,019,400	-	-	$1,019,400
1860-69	[2]		12,900	774,000	-	-	774,000
1870-79	[2]		143,927	7,113,827	117,036	$1,287,569	8,401,396
1880-93	[2]		250,704	10,866,543	1,340,735	26,799,081	37,665,624
1894...	[2]		32,199	1,075,813	147,310	2,459,923	3,535,736
1895...	[2]		28,337	1,090,653	139,043	2,919,483	4,010,136
1896...	[2]		27,721	888,164	155,333	2,969,191	3,857,355
1897...	[2]		30,105	1,511,603	177,976	3,214,699	4,726,302
1898...	[2]		26,513	1,275,666	236,126	5,969,621	7,245,287
1899...	[2]		23,593	1,312,808	251,027	9,563,294	10,876,102
1900...	[2]		29,055	1,397,769	246,087	6,620,127	8,017,896
1901...	[2]		34,876	1,613,921	256,988	6,299,024	7,912,945
1902...	[2]		31,173	1,454,900	257,224	7,890,684	9,345,584
1903...	[2]		28,777	1,558,592	230,908	7,944,993	9,503,585
1904...	[2]		34,530	1,897,896	266,793	9,797,677	11,695,573
1905...	[2]		31,659	1,946,685	253,893	11,584,970	13,531,655
1906...	[2]		39,143	3,048,558	278,713	12,074,105	15,122,663
1907...	8,294,866		41,089	2,865,208	279,576	11,196,668	14,061,876
1908...	6,910,872		41,223	2,029,703	257,767	8,415,156	10,444,859
1909...	9,004,272	[4]	44,902	2,385,956	296,455	11,573,813	13,959,769
1910...	9,982,155	[4]	43,840	2,267,669	296,519	11,333,062	13,600,731
1911...	9,147,991	[4]	45,905	2,545,069	268,670	10,217,993	12,763,062
1912...	10,358,899	[4]	45,328	2,490,315	299,421	14,462,081	16,952,396
1913...	9,220,700	[4]	[5]47,216	2,425,201	291,110	11,214,318	13,639,519
1914...	8,108,420	[4]	41,899	1,956,498	259,099	9,512,606	11,469,104
1915...	12,107,100	[4]	45,350	2,397,566	321,695	23,419,103	25,816,669
1916...	15,377,700	[4]	58,405	4,898,120	382,242	30,123,296	35,021,416
1917...	15,562,700	[4]	75,744	7,638,502	460,662	31,126,468	38,764,970
1918...	10,394,300	[4]	95,472	8,497,637	469,829	23,586,778	32,084,415
1919...	8,948,600	[4]	89,595	6,077,695	488,370	20,819,081	26,896,776
1920...	9,952,200	[4]	107,252	10,143,101	569,595	25,616,563	35,759,664
1921...	4,344,800	[4]	76,679	4,052,907	313,569	7,226,570	11,279,477
1922...	9,038,000	[4]	111,412	8,443,275	524,265	17,826,304	26,269,579
1923...	11,401,900	[4]	111,209	10,561,445	689,528	27,898,393	38,459,838
1924...	12,478,100	[4]	118,770	12,692,372	740,569	30,626,421	43,318,793
1925...	15,432,400	[4]	136,408	15,988,612	806,050	41,332,561	57,321,173
1926...	15,716,400	[6]960,600	132,676	14,096,438	823,643	38,412,521	52,508,959
1927...	11,721,000	3,231,000	106,472	9,269,213	644,558	25,046,201	34,315,414
1928...	9,356,100	3,615,400	90,833	7,327,850	576,787	21,222,225	28,550,075
1929...	11,019,400	4,054,700	96,851	8,178,548	598,990	23,546,169	31,724,717
1930...	6,802,500	4,257,200	48,960	3,206,589	419,385	12,815,587	16,022,176
1931...	3,353,700	2,493,200	27,982	1,256,608	225,779	5,277,087	6,533,695
1932...	1,815,700	568,900	23,523	836,563	169,705	3,096,428	3,932,991
1933...	3,023,200	1,998,700	32,947	1,457,185	259,580	6,786,056	8,243,241
1934...	3,868,400	4,581,200	31,897	1,240,699	291,036	7,897,833	9,138,532
1935...	4,284,900	6,416,800	45,926	1,939,296	362,629	10,388,102	12,327,398
1936...	5,238,400	9,363,200	52,256	2,625,887	428,524	[5]13,460,122	16,086,009
1937...	6,427,000	10,593,000	65,765	4,560,588	446,890	18,558,987	23,119,575
1938...	5,469,900	6,082,400	51,751	2,682,767	361,526	11,100,690	13,783,457
1939...	5,754,000	7,274,000	57,941	3,399,068	413,139	14,199,263	17,598,331
1940...	6,536,700	8,482,000	46,212	2,724,795	429,778	18,062,867	20,787,662
1941...	8,091,579	10,518,611	53,690	3,597,132	478,403	23,960,568	27,557,700
1942...	8,587,337	10,239,121	44,857	4,456,782	443,847	30,905,327	35,362,109
1943...	9,430,812	11,270,106	46,345	[5]5,591,367	376,236	[5]37,818,959	[5]43,410,326
1944...	9,118,388	12,293,010	36,934	[5]4,430,620	355,401	[5]37,144,281	[5]41,574,901
1945...	7,441,345	11,271,347	31,844	3,969,305	259,001	28,386,683	32,355,988
Total	[7]	129,564,495	3,334,057	237,050,949	20,735,020	873,007,632	1,110,058,581

Please see footnotes on p. 18.

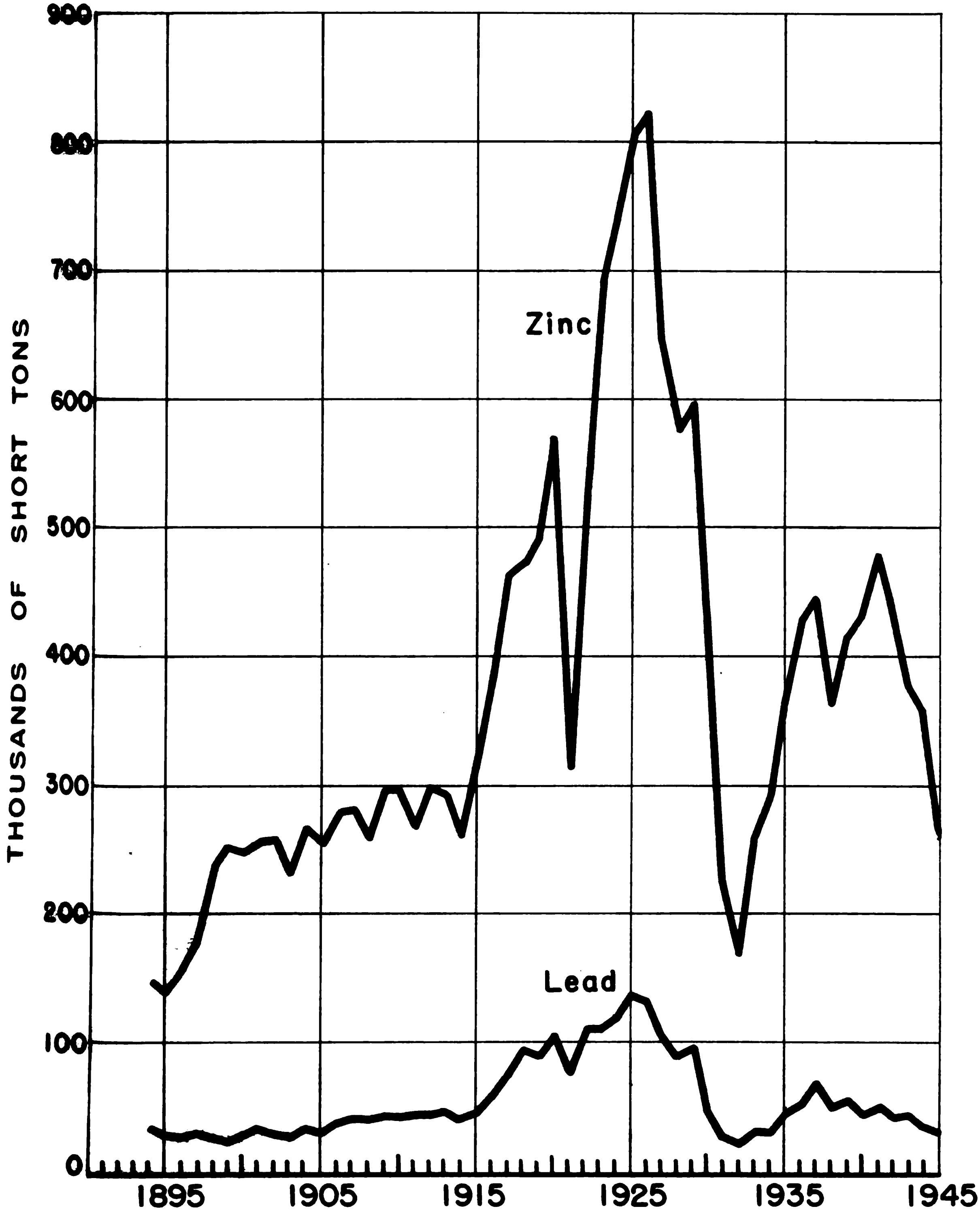
Mine production of lead and zinc in the Tri-State (Missouri-Kansas-Oklahoma) district, 1850-1945 (Cont'd.)

Year	Crude ore treated, short tons	Old tailings treated, short tons	Recoverable metal				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1850-59	2/		3/17,840	$1,926,720	-	-	$1,926,720
1860-69	2/		3/9,030	1,535,100	-	-	1,535,100
1870-79	2/		3/100,749	11,888,382	3/42,895	$5,147,400	17,035,782
1880-93	2/		3/175,272	14,645,606	3/551,878	54.505,238	69,150,844
1894...	2/		23,989	1,578,476	73,065	5,143,776	6,722,252
1895...	2/		21,111	1,372,215	68,965	4,965,480	6,337,695
1896...	2/		20,652	1,230,860	77,045	6,148,191	7,379,051
1897...	2/		22,428	1,619,302	88,276	7,309,253	8,928,555
1898...	2/		19,752	1,485,351	117,827	10,722,257	12,207,608
1899...	2/		17,577	1,571,384	124,509	14,467,946	16,039,330
1900...	2/		21,646	1,917,835	123,290	10,726,230	12,644,065
1901...	2/		25,982	2,265,630	129,265	10,522,171	12,787,801
1902...	2/		23,224	1,895,078	128,354	12,398,997	14,294,075
1903...	2/		21,439	1,813,739	115,454	12,930,848	14,744,587
1904...	2/		25,725	2,248,365	133,663	13,847,486	16,095,851
1905...	2/		23,586	2,245,386	128,725	15,189,550	17,434,936
1906...	2/		29,162	3,301,138	139,635	17,286,813	20,587,951
1907...	8,294,866		31,524	3,341,544	135,824	16,027,232	19,368,776
1908...	6,910,872		31,582	2,652,888	125,537	11,800,478	14,453,366
1909...	9,004,272	4/	35,145	3,022,470	148,990	16,090,920	19,113,390
1910...	9,982,155	4/	34,121	3,002,648	148,803	16,070,724	19,073,372
1911...	9,147,991	4/	35,745	3,217,050	137,633	15,690,162	18,907,212
1912...	10,358,899	4/	35,197	3,167,730	152,465	21,040,170	24,207,900
1913...	9,220,700	4/	36,468	3,209,184	146,474	16,405,088	19,614,272
1914...	8,108,420	4/	32,476	2,533,128	131,085	13,370,670	15,903,798
1915...	12,107,100	4/	34,351	3,228,994	164,544	40,806,912	44,035,906
1916...	15,377,700	4/	44,315	6,115,470	196,596	52,687,728	58,803,198
1917...	15,562,700	4/	57,815	9,944,180	238,768	48,708,672	58,652,852
1918...	10,394,300	4/	74,609	10,594,478	247,516	45,047,912	55,642,390
1919...	8,946,600	4/	69,861	7,405,266	257,514	37,597,044	45,002,310
1920...	9,952,200	4/	84,317	13,490,720	305,290	49,456,980	62,947,700
1921...	4,344,800	4/	61,581	5,542,290	169,211	16,921,100	22,463,390
1922...	9,038,000	4/	87,771	9,654,810	282,078	32,156,892	41,811,702
1923...	11,401,900	4/	86,787	12,150,180	361,655	49,185,080	61,335,260
1924...	12,478,100	4/	92,110	14,737,600	387,449	50,368,370	65,105,970
1925...	15,432,400	4/	105,372	18,334,728	416,943	63,375,336	81,710,064
1926...	15,716,400	6/960,600	102,117	16,338,720	423,800	63,570,000	79,908,720
1927...	11,721,000	3,231,000	81,686	10,292,436	330,530	42,307,840	52,600,276
1928...	9,356,100	3,615,400	70,086	8,129,976	297,020	36,236,440	44,366,416
1929...	11,019,400	4,054,700	74,143	9,342,018	309,436	40,845,552	50,187,570
1930...	6,802,500	4,257,200	36,972	3,697,200	216,961	20,828,256	24,525,456
1931...	3,353,700	2,493,200	21,463	1,588,262	119,168	9,056,768	10,645,030
1932...	1,815,700	568,900	18,131	1,087,860	90,660	5,439,600	6,527,460
1933...	3,023,200	1,998,700	25,137	1,860,138	137,054	11,512,536	13,372,674
1934...	3,868,400	4,581,200	24,465	1,810,410	153,092	13,165,912	14,976,322
1935...	4,284,900	6,416,800	34,849	2,787,920	191,136	16,819,968	19,607,888
1936...	5,238,400	9,363,200	38,842	3,573,464	226,857	22,685,700	26,259,164
1937...	6,427,000	10,593,000	50,274	5,932,332	236,585	30,756,050	36,688,382
1938...	5,469,900	6,082,400	39,400	3,624,800	196,174	18,832,704	22,457,504
1939...	5,754,000	7,274,000	44,176	4,152,544	224,446	23,342,384	27,494,928
1940...	6,536,700	8,482,000	35,311	3,531,100	232,437	29,287,062	32,818,162
1941...	8,091,579	10,518,611	41,080	4,683,120	258,837	38,825,550	43,508,670
1942...	8,587,337	10,239,121	34,341	4,601,694	237,936	44,256,096	48,857,790
1943...	9,430,812	11,270,106	34,722	5,208,300	200,514	43,311,024	48,519,324
1944...	9,118,388	12,293,010	28,059	4,489,440	190,270	43,381,560	47,871,000
1945...	7,441,345	11,271,347	23,556	4,051,632	139,274	32,033,020	36,084,652
Total	7/	129,564,495	2,529,121	290,669,291	10,609,408	1,400,613,128	1,691,282,419

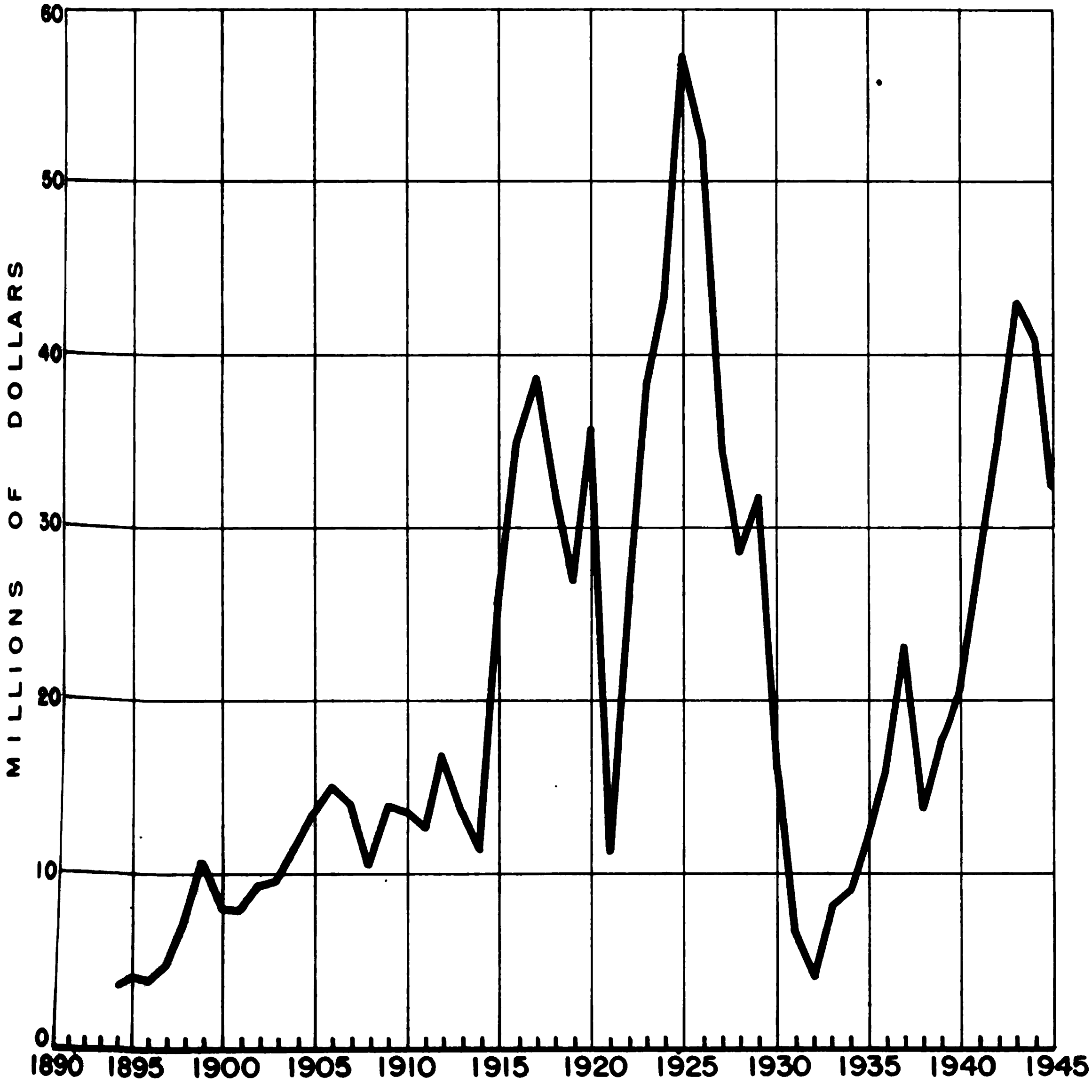
Please see footnotes on p. 18.

Footnotes for table, Mine production of lead and zinc in the Tri-State (Missouri-Kansas-Oklahoma) distict, 1850-1945.

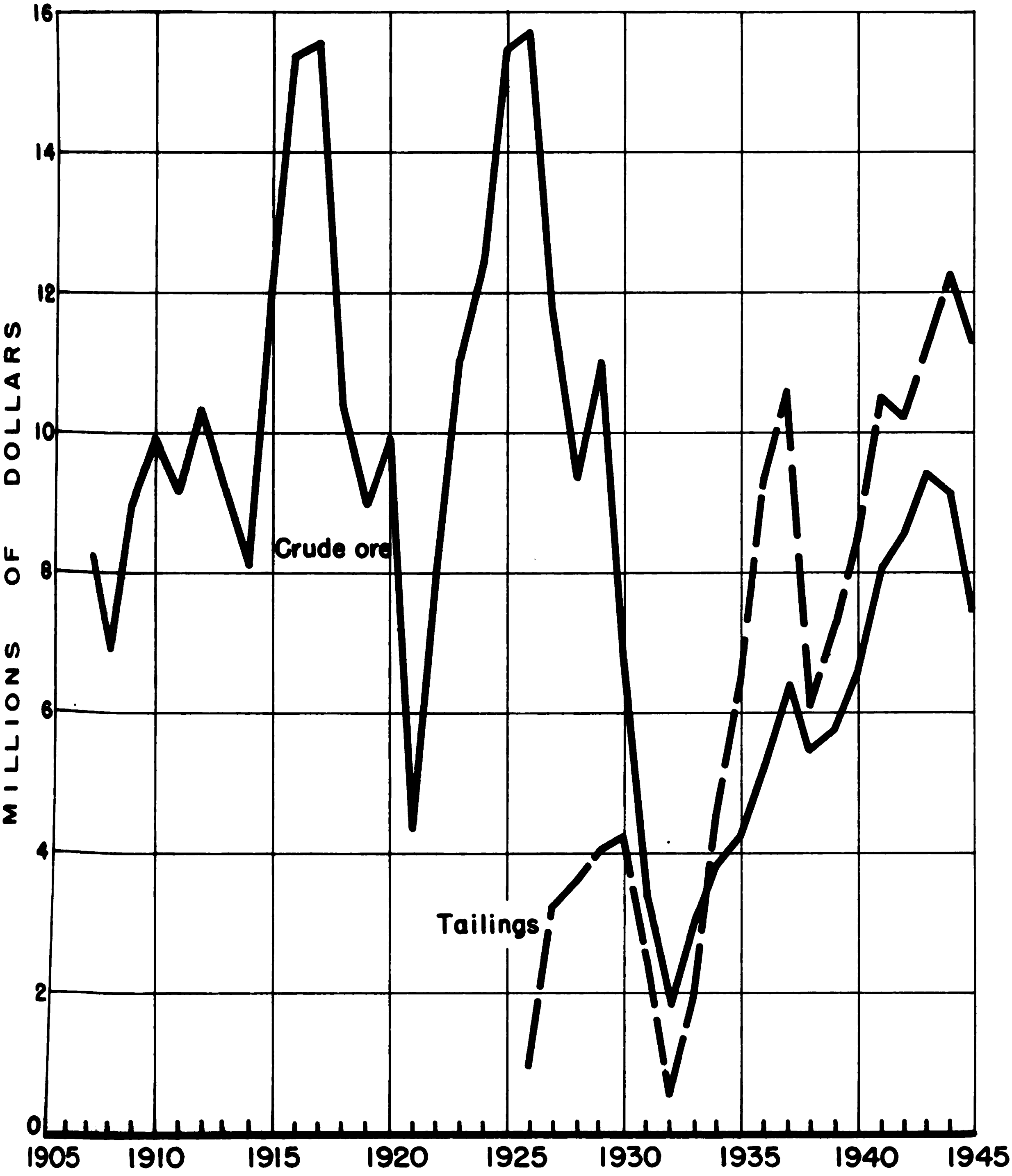
1/ Includes high-grade ore sold without milling, and comprises both sulfide and carbonate or silicate; output of carbonate and silicate has been comparatively small since 1900, and averaged only 1,826 tons annually from 1921-43.
2/ Figures not available.
3/ Figures represent actual metal content of concentrates before deductions for smelting losses.
4/ Some old tailings were treated in the Tri-State district during the period 1909-25, but no separate record was kept of output from that source until it became an important factor in production.
5/ Revised figure.
6/ Oklahoma only.
7/ Total 1850-1945 not available; the total for the period 1907-45, inclusive, is 339,122,736.



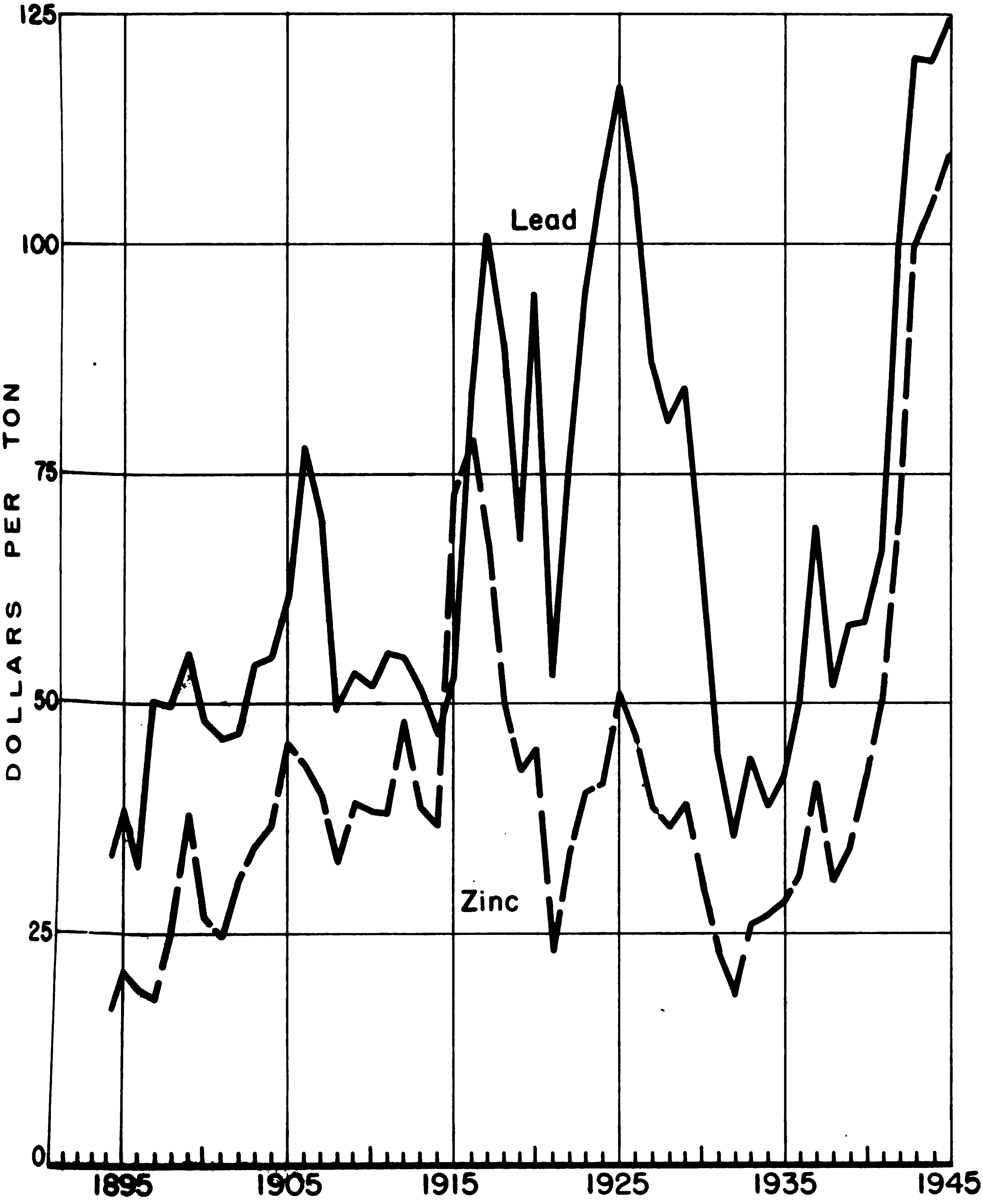
Graph 2.- Production of lead and zinc concentrates in the Tri-State district, 1894-1945.



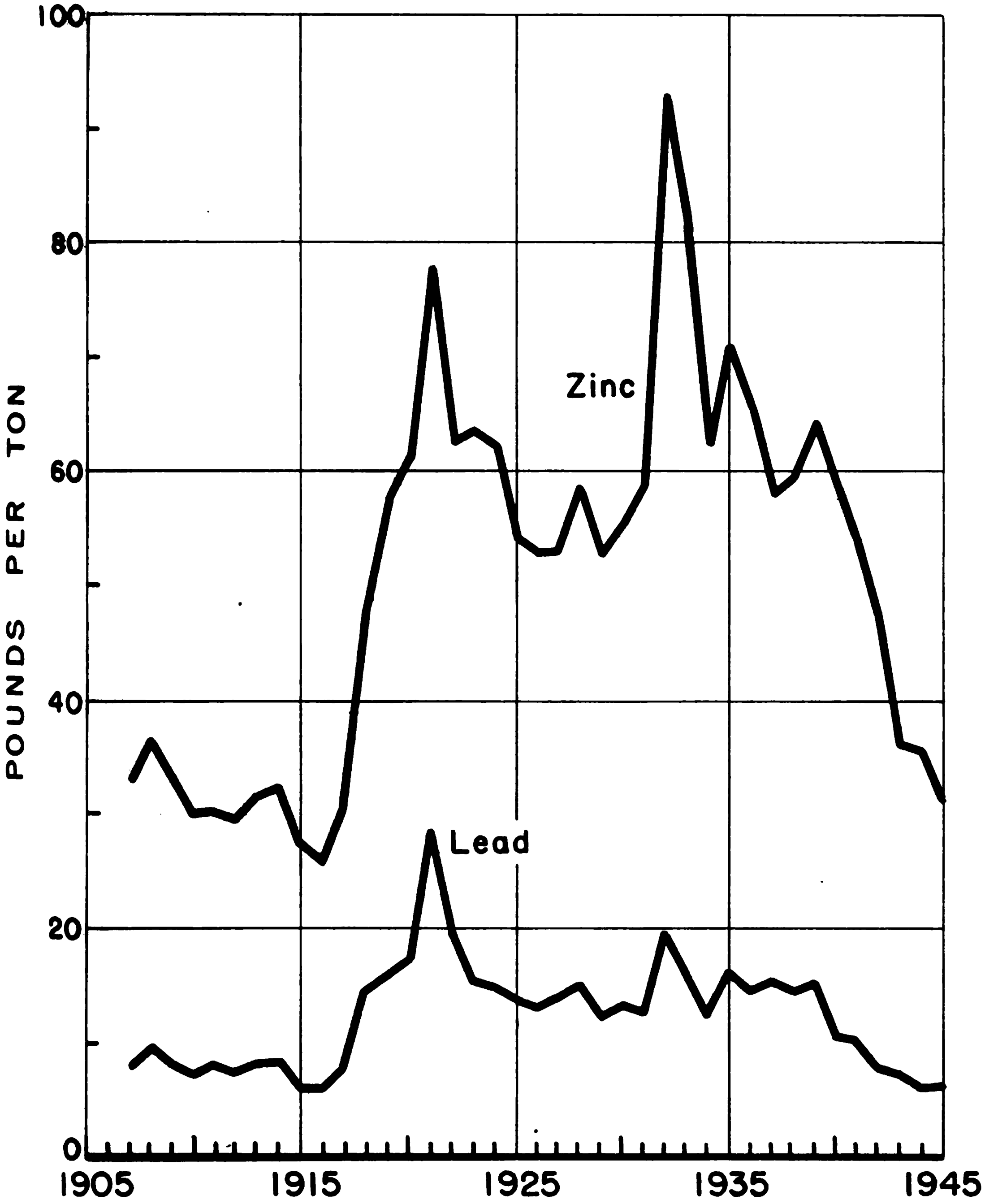
Graph 3.- Mine value of lead and zinc concentrates produced in the Tri-State district, 1894-1945.



Graph 4.- Crude ore treated in the Tri-State district, 1907-45, and old tailings re-treated, 1926-45.



Graph 5.- Average prices of lead and zinc concentrates in the Tri-State district, 1894-1945.



Graph 6.- Metals recovered per ton of crude ore (rock) milled in the Tri-State district, 1907-45.

(Calculated from metal content of concentrates as shown by assay, with allowance for smelting losses averaging slightly more than 10 percent for zinc and about 2 percent for lead.)

Zinc and lead produced in re-treating old tailings in the Tri-State district, 1926-45[1]

Year	Old tailings milled	Concentrates produced					
		Lead			Zinc		
		Short tons	Average assay	Value	Short tons	Average assay	Value
1926	960,600	-	-	-	17,421	[2]55.25	[2]$749,277
1927	3,231,000	420	66.90	$28,327	54,372	55.25	1,805,686
1928	3,615,400	548	69.53	38,444	56,573	56.94	1,875,855
1929	4,054,700	584	63.70	38,922	62,034	56.51	2,191,791
1930	4,257,200	1,111	62.56	53,647	67,331	57.98	1,879,460
1931	2,493,200	613	64.60	20,592	42,585	59.59	896,312
1932	568,900	216	73.15	5,738	15,263	60.06	262,853
1933	1,998,700	463	64.36	12,940	32,125	58.75	880,386
1934	4,581,200	551	51.36	12,018	67,333	58.87	1,776,082
1935	6,416,800	331	62.24	8,688	86,782	59.50	2,416,574
1936	9,363,200	689	63.28	30,459	112,757	59.62	3,408,657
1937	10,593,000	690	58.55	34,086	103,138	59.77	4,256,808
1938	6,082,400	440	52.73	15,916	59,987	59.93	1,885,162
1939	7,274,000	864	56.13	34,770	72,931	59.77	2,409,161
1940	8,482,000	719	52.29	31,682	74,506	59.65	3,018,217
1941	10,518,611	361	51.52	16,022	74,036	58.81	3,606,480
1942	10,239,121	460	55.87	36,826	65,096	57.84	5,148,861
1943	11,270,106	404	50.25	26,832	56,857	57.88	5,331,878
1944	12,293,010	390	51.79	28,106	53,547	58.26	5,256,982
1945	11,271,347	201	51.24	13,893	41,211	58.67	4,325,854
Total	129,564,495	10,055	59.22	487,908	1,215,885	58.64	53,382,336

[1] Some old tailings were treated in the Tri-State district during the period 1909-25, but no separate record was kept of output from that source until it became an important factor in production.

[2] Oklahoma only.

Average prices and metal content of concentrates[1] from the Tri-State district and average prices of lead and zinc, 1850-1945

Year	Ave. price per ton		Metal content of concentrates[2]		Ave. metal price[3] (per lb,	
	Lead concentrates	Zinc concentrates	Lead concentrates (percent lead)	Zinc concentrates (percent zinc)	Lead	Zinc
1850-59	$40.00	-	70.00	-	$0.054	-
1860-69	60.00	-	70.00	-	.085	-
1870-79	49.43	$11.00	70.00	40.00	.059	$0.060
1880...					.050	.055
1881...					.048	.052
1882...					.049	.053
1883...					.043	.045
1884...					.037	.044
1885...					.039	.043
1886...					.046	.044
1887...	[4]/43.34	[4]/19.99	[4]/70.00	[4]/43.00	.045	.046
1888...					.044	.049
1889...					.039	.050
1890...					.045	.055
1891...					.043	.050
1892...					.040	.046
1893...					.037	.040
1894...	33.41	16.70		56.64	.033	.035
1895...	38.49	21.00		56.64	.032	.036
1896...	32.04	19.12		56.64	.030	.039
1897...	50.21	18.06		56.64	.036	.041
1898...	49.63	25.11		56.99	.038	.046
1899...	55.64	38.10		56.67	.045	.058
1900...	48.11	26.90	[5]/76.00	57.36	.044	.044
1901...	46.28	24.51		57.53	.043	.041
1902...	46.67	30.68		57.08	.041	.048
1903...	54.16	34.41		57.30	.042	.054
1904...	54,97	36.72		57.24	.043	.051
1905...	61.49	45.63		57.97	.047	.059
1906...	77.88	43.32		57.20	.057	.061
1907...	69.73	40.05	78.29	56.80	.053	.059
1908...	49.24	32.65	78.97	56.20	.042	.047
1909...	53.14	39.04	79.55	56.66	.043	.054
1910...	51.73	38.22	79.39	56.53	.044	.054
1911...	55.44	38.03	79.58	56.84	.045	.057
1912...	54.94	48.30	79.25	56.57	.045	.069
1913...	51.36	38.52	78.81	56.00	.044	.056
1914...	46.70	36.71	79.01	56.27	.039	.051
1915...	52.87	72.80	77.83	56.62	.047	.124
1916...	83.86	78.81	77.59	57.12	.069	.134
1917...	100.85	67.57	77.88	57.56	.086	.102
1918...	89.01	50.20	79.69	58.50	.071	.091
1919...	67.84	42.63	79.35	58.61	.053	.073
1920...	94.57	44.97	80.16	58.90	.080	.081
1921...	52.86	23.05	81.10	59.98	.045	.050
1922...	75.78	34.00	80.33	59.80	.055	.057
1923...	94.97	40.46	79.65	59.54	.070	.068
1924...	106.87	41.36	79.12	59.42	.080	.065

Please see footnotes on p. 21.

Average prices and metal content of concentrates[1] from the Tri-State district and average prices of lead and zinc, 1850-1945 (Cont'd.)

	Ave. price per ton		Metal content of concentrates[2]		Ave. metal price[3] (per lb.)	
Year	Lead concentrates	Zinc concentrates	Lead concentrates (percent lead)	Zinc concentrates (percent zinc)	Lead	Zinc
1925...	$117.21	$51.28	78.80	58.76	$0.087	$0.076
1926...	106.25	46.64	78.55	58.36	.080	.075
1927...	87.06	38.86	78.30	58.30	.063	.064
1928...	80.67	36.79	78.71	58.26	.058	.061
1929...	84.44	39.31	78.16	58.75	.063	.066
1930...	65.49	30.56	77.00	58.89	.050	.048
1931...	44.91	23.37	78.26	59.98	.037	.038
1932...	35.56	18.25	78.65	60.70	.030	.030
1933...	44.23	26.14	77.85	60.02	.037	.042
1934...	38.90	27.14	78.27	59.77	.037	.043
1935...	42.23	28.65	77.43	59.90	.040	.044
1936...	50.25	31.41	77.40	60.19	.046	.050
1937...	69.35	41.53	78.04	60.25	.059	.065
1938...	51.84	30.71	77.76	59.50	.046	.048
1939...	58.66	34.37	77.79	60.40	.047	.052
1940...	58.96	42.03	77.97	60.09	.050	.063
1941...	66.66	50.08	78.09	60.12	.057	.075
1942...	99.36	69.63	78.12	59.57	[6].067	[6].093
1943...	120.65	100.52	76.45	59.22	[6].075	[6].108
1944...	119.96	104.51	77.52	59.50	[6].080	[6].114
1945...	124.65	109.60	75.45	59.75	[6].086	[6].115

[1] Includes crude ore sold without milling and comprises both sulfides and carbonate and silicate; output of carbonate and silicate has been comparatively small, and its inclusion with sulfides does not materially affect the average price and metal content of the concentrates.

[2] Figures for 1850-1893 are averages for galena and blende given by Arthur Winslow, Lead and Zinc Deposits of Missouri, Missouri Geol. Survey, vol. 7, p. 506, 1894; lead content for 1894-1906 estimated; zinc content for 1894-1896 estimated on basis of composite assays of blende concentrates by W. W. Petreaus, of Joplin, for 1897 from Mineral Resources 1907, pt. 1, p. 529; for 1897-1906, composite assays of blende concentrates of Tri-State district by W. W. Petreaus; 1907-45, lead and zinc data from annual volumes of Mineral Resources and Minerals Yearbook.

[3] Prices for 1850-1879 are averages given by Arthur Winslow (work cited, vol. 7, p. 506); for 1880-1906, from annual volumes of Mineral Resources (average of monthly average prices based upon the average of the highest and lowest monthly quotations for common metal); for 1907-45, from annual volumes of Mineral Resources and Minerals Yearbook.

N.B. The average metal prices used by Winslow for southwestern Missouri for the period 1880-93 (4.1 cents per pound for lead and 5 cents for zinc) differ slightly from the average prices for the same period obtained by averaging the prices given in Mineral Resources and shown in this table.

[4] Average for period 1880-93.

[5] Estimated average for period 1894-1906.

[6] Price includes bonus payments by Metal Reserve Co. for overquota production.

Mine production of lead and zinc in southwestern Missouri, 1850-1945[1]

Year	Crude ore treated, short tons	Old tailings treated, short tons	Concentrates[2]				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1850-59	[3]		25,485	$1,019,400	-	-	$1,019,400
1860-69	[3]		12,900	774,000	-	-	774,000
1870-79	[3]		133,940	6,697,050	116,900	$1,285,400	7,982,450
1880-93	[3]		180,658	7,788,259	1,022,511	20,491,562	28,279,821
1894	[3]		26,382	880,018	118,640	1,969,666	2,849,684
1895	[3]		15,799	608,104	97,811	2,106,691	2,714,795
1896	[3]		13,659	437,634	93,101	1,567,883	2,005,517
1897	[3]		14,920	749,133	118,519	1,722,036	2,471,169
1898	[3]		18,595	922,868	161,274	3,975,390	4,898,258
1899	[3]		16,870	958,497	186,319	7,249,463	8,207,960
1900	[3]		24,117	1,156,773	199,586	5,381,890	6,538,663
1901	[3]		29,638	1,368,040	222,990	5,501,180	6,869,220
1902	[3]		27,046	1,263,260	225,999	6,992,500	8,255,760
1903	[3]		25,638	1,389,470	204,287	7,066,050	8,455,520
1904	[3]		30,746	1,686,776	236,914	8,700,112	10,386,888
1905	[3]		28,493	1,748,515	221,218	10,111,270	11,859,785
1906	[3]		34,237	2,668,758	232,238	10,077,492	12,746,250
1907	7,389,373		37,222	2,637,256	239,885	9,616,781	12,254,037
1908	6,007,966		35,782	1,741,143	218,530	7,221,480	8,962,623
1909	8,090,912		38,916	2,080,851	256,223	10,104,767	12,185,618
1910	9,054,897		37,168	1,932,826	255,238	9,884,942	11,817,768
1911	8,162,076		39,095	2,175,860	237,308	9,142,413	11,318,273
1912	9,321,145		38,035	2,098,504	266,067	12,966,491	15,064,995
1913	8,049,300		36,302	1,864,042	246,709	9,650,358	11,514,400
1914	6,774,000		30,689	1,432,979	208,876	7,754,929	9,187,908
1915	10,505,900		34,463	1,805,782	265,419	19,585,454	21,391,236
1916	13,196,400		40,844	3,452,228	302,675	24,172,067	27,624,295
1917	11,136,100		39,040	3,967,981	262,095	17,685,115	21,653,096
1918	3,614,200		16,477	1,481,503	113,123	5,466,353	6,947,856
1919	1,388,800		7,741	516,754	63,323	2,422,659	2,939,413
1920	1,304,400		4,957	485,532	48,864	2,140,654	2,626,186
1921	243,300		1,764	87,880	19,550	491,365	579,245
1922	727,300		2,260	154,679	30,852	952,411	1,107,090
1923	784,000		3,122	257,685	35,930	1,403,365	1,661,050
1924	459,100		3,000	297,561	24,714	1,010,059	1,307,620
1925	662,200		3,569	384,839	28,456	1,488,593	1,873,432
1926	1,025,500		5,287	553,906	48,841	2,330,101	2,884,007
1927	513,800		3,406	276,599	28,642	1,129,095	1,405,694
1928	281,300		1,577	115,945	18,384	688,466	804,411
1929	428,400		1,417	113,143	14,660	568,024	681,167
1930	328,800		1,399	81,848	12,868	415,491	497,339
1931	104,800		1,694	65,658	3,977	84,131	149,789
1932	46,400		1,495	40,328	1,942	29,428	69,756
1933	109,600	[5]61,200	1,477	54,087	10,123	264,951	319,038
1934	155,600	269,900	1,274	42,619	13,891	363,362	405,981
1935	190,300	364,000	835	29,950	14,420	392,541	422,491
1936	462,500	408,700	2,634	124,409	34,689	1,096,217	1,220,626
1937	558,100	422,000	5,760	376,391	39,405	1,654,569	2,030,960
1938	353,000	126,600	4,234	212,858	19,496	578,020	790,878
1939	523,800	-	3,674	199,885	28,690	961,344	1,161,229
1940	497,500	117,000	2,875	161,002	23,724	970,321	1,131,323
1941	777,351	252,603	2,174	130,109	39,790	1,937,827	2,067,936
1942	1,404,731	751,252	2,810	304,195	68,391	4,814,960	5,119,155
1943	1,861,044	704,125	7,679	908,591	57,394	5,775,340	6,683,931
1944	2,052,979	516,894	6,303	753,651	67,104	7,116,997	7,870,648
1945	1,482,084	468,923	4,679	635,031	40,762	4,650,247	5,285,278
Total	[6]	4,463,197	1,172,252	66,152,645	7,169,337	283,180,273	349,332,918

Please see footnotes on page 24.

Mine production of lead and zinc in southwestern Missouri, 1850-1945 1/ (Cont'd.)

Year	Crude ore treated, short tons	Old tailings treated, short tons	Recoverable metal				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1850-59	3/		4/17,840	$1,926,720	-	-	$1,926,720
1860-69	3/		4/ 9,030	1,535,100	-	-	1,535,100
1870-79	3/		4/93,758	11,063,444	4/42,845	$5,141,400	16,204,844
1880-93	3/		4/126,461	10,369,802	4/420,919	42,091,900	52,461,702
1894	3/		19,655	1,293,299	58,845	4,142,688	5,435,987
1895	3/		11,770	765,050	48,514	3,493,008	4,258,058
1896	3/		10,176	606,490	46,178	3,685,004	4,291,494
1897	3/		11,115	802,503	58,785	4,867,398	5,669,901
1898	3/		13,853	1,041,746	80,476	7,323,316	8,365,062
1899	3/		12,568	1,123,579	92,414	10,738,507	11,862,086
1900	3/		17,967	1,591,876	99,993	8,699,391	10,291,267
1901	3/		22,080	1,925,376	112,164	9,130,150	11,055,526
1902	3/		20,149	1,644,158	112,773	10,893,872	12,538,030
1903	3/		19,100	1,615,860	102,143	11,440,016	13,055,876
1904	3/		22,906	2,001,984	118,694	12,296,698	14,298,682
1905	3/		21,227	2,020,810	112,158	13,234,644	15,255,454
1906	3/		25,507	2,887,392	116,351	14,404,254	17,291,646
1907	7,389,373		28,499	3,020,894	116,395	13,734,610	16,755,504
1908	6,007,966		27,369	2,298,996	106,889	10,047,566	12,346,562
1909	8,090,912		30,513	2,624,118	129,787	14,016,996	16,641,114
1910	9,054,897		28,927	2,545,576	129,246	13,958,568	16,504,144
1911	8,162,076		30,492	2,744,280	122,282	13,940,148	16,684,428
1912	9,321,145		29,553	2,659,770	136,173	18,791,874	21,451,644
1913	8,049,300		27,987	2,462,856	124,722	13,968,864	16,431,720
1914	6,774,000		23,690	1,847,820	105,809	10,792,518	12,640,338
1915	10,505,900		26,003	2,444,282	135,928	33,710,144	36,154,426
1916	13,196,400		30,827	4,254,126	155,527	41,681,236	45,935,362
1917	11,136,100		29,019	4,991,268	132,730	27,076,920	32,068,188
1918	3,614,200		12,527	1,778,834	55,918	10,177,076	11,955,910
1919	1,388,800		6,009	636,954	31,468	4,594,328	5,231,282
1920	1,304,400		3,779	604,640	24,490	3,967,380	4,572,020
1921	243,300		1,350	121,500	10,845	1,084,500	1,206,000
1922	727,300		1,644	180,840	16,171	1,843,494	2,024,334
1923	784,000		2,285	319,900	18,265	2,484,040	2,803,940
1924	459,100		2,192	350,720	12,920	1,679,600	2,030,320
1925	662,200		2,651	461,274	14,794	2,248,688	2,709,962
1926	1,025,500		3,950	632,000	24,926	3,738,900	4,370,900
1927	513,800		2,509	316,134	14,492	1,854,976	2,171,110
1928	281,300		1,123	130,268	9,517	1,161,074	1,291,342
1929	428,400		1,034	130,284	7,544	995,808	1,126,092
1930	328,800		1,010	101,000	6,504	624,384	725,384
1931	104,800		1,171	86,654	1,985	150,860	237,514
1932	46,400		1,007	60,420	946	56,760	117,180
1933	109,600	5/61,200	1,010	74,740	5,042	423,528	498,268
1934	155,600	269,900	913	67,562	7,059	607,074	674,636
1935	190,300	364,000	552	44,160	7,263	639,144	683,304
1936	462,500	408,700	2,006	184,552	18,665	1,866,500	2,051,052
1937	558,100	422,000	4,426	522,268	20,589	2,676,570	3,198,838
1938	353,000	126,600	3,157	290,444	10,226	981,696	1,272,140
1939	523,800	-	2,759	259,346	15,096	1,569,984	1,829,330
1940	497,500	117,000	2,144	214,400	12,470	1,571,220	1,785,620
1941	777,351	252,603	1,521	173,394	20,832	3,124,800	3,298,194
1942	1,404,731	751,252	2,116	283,544	35,552	6,612,672	6,896,216
1943	1,861,044	704,125	5,776	866,400	29,490	6,369,840	7,236,240
1944	2,052,979	516,894	4,721	755,360	35,118	8,006,904	8,762,264
1945	1,482,084	468,923	3,522	605,784	21,580	4,963,400	5,569,184
Total	6/	4,463,197	866,905	86,362,551	3,508,507	449,376,890	535,739,441

Please see footnotes on p. 24

Footnotes for table, Mine production of lead and zinc in southwestern Missouri, 1850-1945.

1/ All figures for periods 1850-1893 from Lead and Zinc Deposits of Missouri (sec. 2), Missouri Geol. Survey, vol. 7, pp. 507-539, by Arthur Winslow (includes production of Barry, Christian, Dade, Green, Jasper, Lawrence, Newton, and Wright Counties).

Figures for tonnage and value of concentrates for 1894, 1896, and 1897 from Mineral Resources of United States, 1899, p. 253 (collected by Joplin Mining News), with Kansas output deducted; for 1895, from Mineral Resources, 1895, lead figures p. 151, zinc pp. 165-166 (compiled by Joplin Herald), with deduction for Kansas output; for 1898, from Mineral Resources, 1898, pp.252-253 (compiled by Joplin Herald); for 1899, from Mineral Resources, 1899, p. 252 (figures compiled by Joplin Herald); for 1900, Mineral Resources, 1900, p. 217 (figures compiled by Joplin Mining News); for 1901, Mineral Resources, 1901, p. 214 (figures compiled by Jesse A. Zook, of Joplin, for Daily News Herald); for 1902, Mineral Resources, 1902, p. 219 (figures compiled by Jesse A.Zook for Daily Globe); for 1903 Mineral Resources, 1903, pp. 255-256 (figures compiled by Jesse A. Zook for Daily Globe); for 1904, Mineral Resources, 1904, pp. 275-276 (compiled by local authorities); for 1905, Mineral Resources, 1905, p. 373 (figures compiled by local authorities); for 1906, Mineral Resources, 1906, lead p. 448, zinc p. 469 (figures compiled by Jesse A. Zook of Joplin).

Metal content of the zinc concentrates for period 1894-1906 estimated from composite assays of blende concentrates shipped during 1897-1906, made by W. W. Petraeus, of Joplin, and recorded in Mineral Resources, 1907, p. 529, with allowances for losses in smelting and for slightly lower average assay resulting from inclusion of comparatively small quantities of silicate and carbonate. The metal content of the lead concentrates for the period 1894-1906 is estimated on the basis of the weighted averages for the 14-year periods immediately preceding and following this period.

All figures for the period 1907-45 from annual volumes of Mineral Resources and Minerals Yearbook.

2/ Includes high-grade ore sold without milling and comprises both sulfide and carbonate or silicate; output of carbonate and silicate has been comparatively small since 1900 and averaged only about 1,700 tons annually from 1921-45.

3/ Figures not available.

4/ Figures represent actual metal content of concentrates before deduction for smelting losses.

5/ Data on retreatment of old tailings in Missouri prior to 1933 not available.

6/ Total 1850-1945 not available; the total for the period 1907-45, inclusive, is 120,028,958.

Mine production of lead and zinc in Kansas, 1876-1945[1]

Year	Crude ore treated, short tons	Old tailings treated, short tons	Concentrates 2/				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1876-79	4/		9,987	$416,777	136	$2,169	$418,946
1880	4/		10,684	482,917	7,248	115,968	598,885
1881	4/		7,800	324,150	14,323	236,330	560,480
1882	4/		5,000	230,800	16,552	329,385	560,185
1883	4/		4,000	175,000	16,391	286,843	461,843
1884	4/		5,170	190,000	18,985	341,730	531,730
1885	4/		3,000	145,890	22,203	388,553	534,443
1886	4/		2,962	174,766	31,768	587,708	762,474
1887	4/		3,073	161,500	32,795	623,105	784,605
1888	4/		2,624	81,344	33,391	701,211	782,555
1889	4/		3,993	183,655	32,950	790,800	974,455
1890	4/		4,174	176,176	21,675	498,525	674,701
1891	4/		3,602	182,272	20,641	454,102	636,374
1892	4/		7,188	301,903	23,811	476,238	778,141
1893	4/		5,140	195,314	25,028	471,789	667,103
1894	4/		5,817	195,795	28,670	490,257	686,052
1895	4/		12,538	482,549	41,232	812,792	1,295,341
1896	4/		14,062	450,530	62,232	1,401,308	1,851,838
1897	4/		15,185	762,470	59,457	1,492,663	2,255,133
1898	4/		7,918	352,798	74,852	1,994,231	2,347,029
1899	4/		6,723	354,311	64,708	2,313,831	2,668,142
1900	4/		4,938	240,996	46,501	1,238,237	1,479,233
1901	4/		5,238	245,881	33,998	797,844	1,043,725
1902	4/		4,127	191,640	31,225	898,184	1,089,824
1903	4/		3,139	169,122	26,621	878,943	1,048,065
1904	4/		3,634	202,870	29,246	1,076,320	1,279,190
1905	4/		2,600	163,720	30,005	1,370,220	1,533,940
1906	4/		4,237	328,501	43,233	1,872,085	2,200,586
1907	826,625		3,200	182,906	35,965	1,445,212	1,628,118
1908	677,722		3,205	170,227	28,919	937,060	1,107,287
1909	595,786		1,680	81,728	23,343	892,498	974,226
1910	704,046		3,034	146,780	27,240	999,671	1,146,451
1911	761,465		3,621	197,852	20,409	737,064	934,916
1912	744,254		3,036	160,133	21,383	1,008,661	1,168,794
1913	590,300		3,104	158,062	20,231	796,228	954,290
1914	540,500		1,808	79,976	21,850	830,799	910,775
1915	709,400		1,618	85,415	27,824	1,926,493	2,011,908
1916	774,400		2,217	162,103	24,282	1,824,265	1,986,368
1917	903,400		3,929	368,987	38,787	2,674,098	3,043,085
1918	1,025,400		9,083	825,703	55,979	2,937,644	3,763,347
1919	1,391,600		14,024	957,421	87,956	3,901,260	4,858,681
1920	1,704,700		20,831	2,005,517	113,148	5,154,572	7,160,089
1921	1,132,000		22,679	1,223,917	68,450	1,585,051	2,808,968
1922	2,151,200		29,436	2,300,110	104,219	3,498,030	5,798,140
1923	2,680,700		22,613	2,187,892	190,454	7,763,314	9,951,206
1924	3,215,000		23,888	2,593,285	199,627	8,488,453	11,081,738
1925	4,165,000		29,480	3,497,679	228,383	12,034,387	15,532,066
1926	4,717,500		36,764	3,850,363	243,107	11,676,256	15,526,619
1927	4,008,100	5/497,700	35,622	3,140,591	211,688	8,441,140	11,581,731
1928	3,547,100	1,115,100	32,417	2,619,930	204,332	7,680,962	10,300,892
1929	4,182,600	1,138,600	34,393	2,961,776	210,253	8,551,183	11,512,959
1930	2,355,100	1,162,200	16,935	1,143,819	143,348	4,480,572	5,624,391
1931	1,040,800	872,400	9,283	404,231	73,690	1,651,992	2,056,223
1932	507,100	243,400	8,379	327,344	49,487	889,066	1,216,410
1933	725,400	503,600	7,832	356,523	77,246	2,077,251	2,433,774
1934	1,163,300	933,400	8,734	346,557	72,862	2,010,505	2,357,062
1935	1,337,400	1,562,700	14,301	579,690	102,078	2,948,509	3,528,199
1936	1,822,900	2,821,900	14,789	765,746	149,095	6/4,735,457	5,501,203
1937	2,081,300	3,526,600	20,559	1,454,507	151,646	6,476,064	7,930,571
1938	2,044,500	1,706,800	19,909	1,023,851	133,546	4,132,248	5,156,099
1939	1,764,300	1,937,000	17,845	1,010,106	126,235	4,300,365	5,310,471
1940	1,843,800	1,310,000	15,424	907,296	105,070	4,420,360	5,327,656
1941	2,446,207	1,250,040	18,888	1,264,147	131,406	6,595,506	7,859,653
1942	2,170,121	1,701,931	12,253	1,167,302	103,247	6,926,745	8,094,047
1943	2,790,570	1,685,197	12,243	6/1,473,891	105,656	6/10,792,583	6/12,266,474
1944	3,175,152	2,054,643	12,176	6/1,418,781	117,827	6/11,959,317	6/13,378,098
1945	2,693,110	1,883,269	9,967	1,236,322	89,305	9,715,271	10,951,593
Total	7/	27,906,380	729,752	52,402,113	4,829,450	202,837,483	255,239,596

Please see footnotes on p. 27.

Mine production of lead and zinc in Kansas, 1876-1945 1/ (Cont'd.)

Year	Crude ore treated, short tons	Old tailings treated, short tons	Recoverable metal 3/				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1876-79	4/		6,991	$824,938	50	$6,000	$830,[illegible]
1880	4/		7,479	747,900	2,984	328,240	1,076,140
1881	4/		5,460	524,160	5,896	613,184	1,137,344
1882	4/		3,500	343,000	6,814	722,284	1,065,284
1883	4/		2,800	240,800	6,747	607.230	848,030
1884	4/		3,619	267,806	7,615	687,720	955,526
1885	4/		2,100	163,800	9,140	786,040	949,840
1886	4/		2,073	190,716	13,077	1,150,776	1,341,492
1887	4/		2,151	193,590	13,500	1,242,000	1,435,590
1888	4/		1,837	161,656	13,745	1,347,010	1,508,666
1889	4/		2,795	218,010	13,563	1,356,300	1,574,310
1890	4/		2,922	262,980	8,923	981,530	1,244,510
1891	4/		2,521	216,806	8,497	849,700	1,066,506
1892	4/		5,032	402,560	9,802	901,784	1,304,344
1893	4/		3,598	266,252	10,303	824,240	1,090,492
1894	4/		4,334	285,177	14,220	1,001,088	1,286,265
1895	4/		9,341	607,165	20,451	1,472,472	2,079,637
1896	4/		10,476	624,370	30,867	2,463,187	3,087,557
1897	4/		11,313	816,799	29,491	2,441,855	3,258,654
1898	4/		5,899	443,605	37,351	3,398,941	3,842,546
1899	4/		5,009	447,805	32,095	3,729,439	4,177,244
1900	4/		3,679	325,959	23,297	2,026,839	2,352,798
1901	4/		3,902	340,254	17,101	1,392,021	1,732,275
1902	4/		3,075	250,920	15,581	1,505,125	1,756,045
1903	4/		2,339	197,879	13,311	1,490,832	1,688,711
1904	4/		2,707	236,592	14,652	1,517,947	1,754,539
1905	4/		1,937	184,402	15,213	1,795,134	1,979,536
1906	4/		3,157	357,372	21,660	2,681,508	3,038,880
1907	826,625		2,504	265,424	17,772	2,097,096	2,362,520
1908	677,722		2,468	207,312	14,119	1,327,186	1,534,498
1909	595,786		1,274	109,564	11,445	1,236,060	1,345,624
1910	704,046		2,364	208,032	13,229	1,428,732	1,636,764
1911	761,465		2,802	252,180	10,272	1,171,008	1,423,188
1912	744,254		2,324	209,160	10,633	1,467,354	1,676,514
1913	590,300		2,378	209,264	10,088	1,129,856	1,339,120
1914	540,500		1,381	107,718	11,284	1,150,968	1,258,686
1915	709,400		1,188	111,672	14,365	3,562,520	3,674,192
1916	774,400		1,615	222,870	12,448	3,336,064	3,558,934
1917	903,400		2,965	509,980	20,249	4,130,796	4,640,776
1918	1,025,400		7,107	1,009,194	30,197	5,495,854	6,505,048
1919	1,391,600		11,057	1,172,042	47,636	6,954,856	8,126,898
1920	1,704,700		16,452	2,632,320	61,073	9,893,826	12,526,146
1921	1,132,000		18,679	1,681,110	36,994	3,699,400	5,380,510
1922	2,151,200		23,271	2,559,310	56,225	6,409,650	8,969,460
1923	2,680,700		17,598	2,463,720	100,969	13,731,784	16,195,504
1924	3,215,000		18,560	2,969,600	105,392	13,700,960	16,670,560
1925	4,165,000		22,775	3,962,850	118,778	18,054,256	22,017,106
1926	4,717,500		28,463	4,554,080	126,307	18,946,050	23,500,130
1927	4,008,100	5/497,700	27,497	3,464,622	109,427	14,006,656	17,471,278
1928	3,547,100	1,115,100	25,276	2,932,016	107,251	13,084,622	16,016,638
1929	4,182,600	1,138,500	26,596	3,351,096	109,850	14,500,200	17,851,296
1930	2,355,100	1,162,200	12,910	1,291,000	74,304	7,133,184	8,424,184
1931	1,040,800	872,400	7,082	524,068	39,051	2,967,876	3,491,944
1932	507,100	243,400	6,490	389,400	26,277	1,576,620	1,966,020
1933	725,400	503,600	6,089	450,586	40,947	3,439,548	3,890,134
1934	1,163,300	933,400	6,805	503,570	38,261	3,290,446	3,794,016
1935	1,337,400	1,562,700	10,892	871,360	54,110	4,761,680	5,633,040
1936	1,822,900	2,821,900	11,409	1,049,628	79,017	7,901,700	8,951,328
1937	2,081,300	3,526,600	16,008	1,888,944	80,300	10,439,000	12,327,944
1938	2,044,500	1,706,800	15,239	1,401,988	73,024	7,010,304	8,412,292
1939	1,764,300	1,937,000	13,697	1,287,518	68,971	7,172,984	8,460,502
1940	1,843,800	1,310,000	11,927	1,192,700	57,032	7,186,032	8,378,732
1941	2,446,207	1,250,040	14,538	1,657,332	71,403	10,710,450	12,367,782
1942	2,170,121	1,701,931	9,419	1,262,146	55,874	10,392,564	11,654,710
1943	2,790,570	1,685,197	9,213	1,381,950	56,944	12,299,904	13,681,854
1944	3,175,152	2,054,643	9,394	1,503,040	63,703	14,524,284	16,027,324
1945	2,693,110	1,883,269	7,370	1,267,640	48,394	11,130,620	12,398,260
Total	7/	27,906,380	557,122	63,231,779	2,499,761	321,773,376	385,005,155

Please see footnotes on p. 27.

Footnotes for table, Mine production of lead and zinc in Kansas, 1876-1945.

1/ Lead concentrate figures for 1876-79 represent total of output recorded for 1876 by Arthur Winslow in Lead and Zinc deposits of Missouri, Missouri Geol. Survey, vol. 6, p. 254, and output of Southside Mining & Manufacturing Co. from 1877-79 recorded by Haworth, Erasmus, and others in History, Geography, Geology, and Metallurgy of Galena-Joplin lead and zinc, Kansas University Geol. Survey, vol. 8, p. 106, 1904; for 1880, figures by Arthur Winslow (work cited above); for 1881-83, estimated; for 1884, figures by Arthur Winslow, vol. 6, pp. 254-256 (of work cited); for 1885, estimated; for 1886-1903, by Haworth, Erasmus, and others (work cited above); for 1904, Mineral Resources of the United States, 1904, p. 275 (figures obtained from local authorities); for 1905-1906, Mineral Resources, 1906, p. 469 (figures obtained from local sources, those for 1906 being compiled by Jesse A. Zook of Joplin); for 1907-45, from annual volumes, Mineral Resources and Minerals Yearbook.

Zinc concentrate production for 1876-79 is output of Southside Mining & Manufacturing Co. for 1879, recorded by Haworth, Erasmus, and others (work cited above); for 1880-1885, by Arthur Winslow (pp. 254-256 of work cited above); 1886-1903 by Haworth, Erasmus, and others (p. 105 of work cited above); for 1904 from Mineral Resources, 1904, p. 275 (figures obtained from local authorities); for 1905-1906, from Mineral Resources, 1906, p. 469 (figures obtained from local sources, those for 1906 being compiled by Jesse A. Zook of Joplin); 1907-45, from annual volumes, Mineral Resources and Minerals Yearbook.

The metal content of the Kansas concentrates for the period 1876-1906 is based on the averages used for southwestern Missouri during the same period; for 1907-1945, figures compiled from annual volumes of Mineral Resources and Minerals Yearbook.

2/ Includes high-grade ore sold without milling, and small quantities of carbonate and silicate in some years.

3/ Figures for years 1876-93 represent actual metal content of concentrates before deduction for smelting losses.

4/ Figures not available.

5/ Data not available on retreatment of old tailings in Kansas prior to 1927.

6/ Revised figure.

7/ Total 1876-1945 not available; the total for the period 1907-45, inclusive, is 71,709,858.

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Mine production of Lead and Zinc in northeastern Oklahoma, (Ottawa County) 1891-1945[1]

Year	Crude ore treated, short tons	Old tailings treated, short tons	Concentrates[2]				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1891-1903	[3]		1,636	$72,597	463	$5,232	$77,829
1904	[3]		150	8,250	633	21,245	29,495
1905	[3]		566	34,450	2,670	103,480	137,930
1906	[3]		669	51,299	3,242	124,528	175,827
1907	78,868		667	45,046	3,726	134,675	179,721
1908	225,184		2,236	118,333	10,318	256,616	374,949
1909	317,574		4,306	223,377	16,889	576,548	799,925
1910	223,212		3,638	188,063	14,041	448,449	636,512
1911	224,450		3,189	171,357	10,953	338,516	509,873
1912	293,500		4,257	231,678	11,971	486,929	718,607
1913	581,100		7,810	403,097	24,170	767,732	1,170,829
1914	793,920		9,402	443,543	28,373	926,878	1,370,421
1915	891,800		9,269	506,369	28,452	1,907,156	2,413,525
1916	1,406,900		15,344	1,283,789	55,285	4,126,964	5,410,753
1917	3,523,200		32,775	3,301,534	159,780	10,767,255	14,068,789
1918	5,754,700		69,912	6,190,431	300,727	15,182,781	21,373,212
1919	6,168,200		67,830	4,603,520	337,091	14,495,162	19,098,682
1920	6,943,100		81,464	7,652,052	407,583	18,321,337	25,973,389
1921	2,969,500		52,236	2,741,110	225,569	5,150,154	7,891,264
1922	6,159,500		79,716	5,988,486	389,194	13,375,863	19,364,349
1923	7,937,200		85,474	8,115,868	463,144	18,731,714	26,847,582
1924	8,804,000		91,882	9,801,526	516,228	21,127,909	30,929,435
1925	10,605,200		103,359	12,106,094	549,211	27,809,581	39,915,675
1926	9,973,400	[5] 960,600	90,625	9,692,169	531,695	24,406,164	34,098,333
1927	7,199,100	2,733,300	67,444	5,852,023	404,228	15,475,966	21,327,989
1928	5,527,700	2,500,300	56,839	4,591,975	354,071	12,852,797	17,444,772
1929	6,408,400	2,916,200	61,041	5,103,629	374,077	14,426,962	19,530,591
1930	4,118,600	3,095,000	30,626	1,980,922	263,169	7,919,524	9,900,446
1931	2,208,100	1,620,800	17,005	786,719	148,112	3,540,964	4,327,683
1932	1,262,200	325,500	13,649	468,891	118,276	2,177,934	2,646,825
1933	2,188,200	1,433,900	23,638	1,046,575	172,211	4,443,854	5,490,429
1934	2,549,500	3,377,900	21,889	851,523	204,283	5,523,966	6,375,489
1935	2,757,200	4,490,100	30,790	1,329,656	246,131	7,047,052	8,376,708
1936	2,953,000	6,132,600	34,833	1,735,732	244,740	7,628,448	9,364,180
1937	3,787,600	6,644,400	39,446	2,729,690	255,839	10,428,354	13,158,044
1938	3,072,400	4,249,000	27,608	1,446,058	208,484	6,390,422	7,836,480
1939	3,465,900	5,337,000	36,422	2,189,077	258,214	8,937,554	11,126,631
1940	4,195,400	7,055,000	27,913	1,656,497	300,984	12,672,186	14,328,683
1941	4,868,021	9,015,968	32,628	2,202,876	307,207	15,427,235	17,630,111
1942	5,012,485	7,785,938	29,794	2,985,285	272,209	19,163,622	22,148,907
1943	4,779,198	8,880,784	26,423	3,208,885	213,186	21,251,036	24,459,921
1944	3,890,257	9,721,473	18,455	2,258,188	170,470	18,067,967	20,326,155
1945	3,266,151	8,919,155	17,198	2,097,952	128,934	14,021,165	16,119,117
Total	[6]	97,194,918	1,432,053	118,496,191	8,736,233	386,989,876	505,486,067

[1] Figures for 1891-1903 estimated from general data given in Mineral Resources, 1914, pt.1, p. 106; for 1904 from Mineral Resources, 1904, p. 275 (given under Baxter Springs, Kans., but later data indicated ore came from Indian Territory); for 1905-1906, from Mineral Resources 1906, p. 469; for 1907-45, all figures from annual volumes, Mineral Resources and Minerals Yearbook. The metal content of the Oklahoma concentrates and the metal values for the period 1891-1906 are based upon the averages used for southwestern Missouri during the same period.

Mine production of Lead and Zinc in northeastern Oklahoma, (Ottawa County) 1891-1945[1] (Cont'd.)

Year	Crude ore treated, short tons	Old tailings treated, short tons	Recoverable metal				
			Lead		Zinc		
			Short tons	Value	Short tons	Value	Total value
1891-1903	3/		4/924	$75,768	4/153	$15,300	$91,068
1904	3/		112	9,789	317	32,841	42,630
1905	3/		422	40,174	1,354	159,772	199,946
1906	3/		498	56,374	1,624	201,051	257,425
1907	78,868		521	55,226	1,657	195,526	250,752
1908	225,184		1,745	146,580	4,529	425,726	572,306
1909	317,574		3,358	288,788	7,758	837,864	1,126,652
1910	223,212		2,830	249,040	6,328	683,424	932,464
1911	224,450		2,451	220,590	5,079	579,006	799,596
1912	293,500		3,320	298,800	5,659	780,942	1,079,742
1913	581,100		6,103	537,064	11,664	1,306,368	1,843,432
1914	793,920		7,405	577,590	13,992	1,427,184	2,004,774
1915	891,800		7,160	673,040	14,251	3,534,248	4,207,288
1916	1,406,900		11,873	1,638,474	28,621	7,670,428	9,308,902
1917	3,523,200		25,831	4,442,932	85,789	17,500,956	21,943,888
1918	5,754,700		54,975	7,806,450	161,401	29,374,982	37,181,432
1919	6,168,200		52,795	5,596,270	178,410	26,047,860	31,644,130
1920	6,943,100		64,086	10,253,760	219,727	35,595,774	45,849,534
1921	2,969,500		41,552	3,739,680	121,372	12,137,200	15,876,880
1922	6,159,500		62,856	6,914,160	209,682	23,903,748	30,817,908
1923	7,937,200		66,904	9,366,560	242,421	32,969,256	42,335,816
1924	8,804,000		71,358	11,417,280	269,137	34,987,810	46,405,090
1925	10,605,200		79,946	13,910,604	283,371	43,072,392	56,982,996
1926	9,973,400	5/960,600	69,704	11,152,640	272,567	40,885,050	52,037,690
1927	7,199,100	2,733,300	51,680	6,511,680	206,611	26,446,208	32,957,888
1928	5,527,700	2,500,300	43,687	5,067,692	180,252	21,990,744	27,058,436
1929	6,408,400	2,916,200	46,513	5,860,638	192,042	25,349,544	31,210,182
1930	4,118,600	3,095,000	23,052	2,305,200	136,153	13,070,688	15,375,888
1931	2,208,100	1,620,800	13,210	977,540	78,132	5,938,032	6,915,572
1932	1,262,200	325,500	10,634	638,040	63,437	3,806,220	4,444,260
1933	2,188,200	1,433,900	18,038	1,334,812	91,065	7,649,460	8,984,272
1934	2,549,500	3,377,900	16,747	1,239,278	107,772	9,268,392	10,507,670
1935	2,757,200	4,490,100	23,405	1,872,400	129,763	11,419,144	13,291,544
1936	2,953,000	6,132,600	25,427	2,339,284	129,175	12,917,500	15,256,784
1937	3,787,600	6,644,400	29,840	3,521,120	135,696	17,640,480	21,161,600
1938	3,072,400	4,249,000	21,004	1,932,368	112,924	10,840,704	12,773,072
1939	3,465,900	5,337,000	27,720	2,605,680	140,379	14,599,416	17,205,096
1940	4,195,400	7,055,000	21,240	2,124,000	162,935	20,529,810	22,653,810
1941	4,868,021	9,015,968	25,021	2,852,394	166,602	24,990,300	27,842,694
1942	5,012,485	7,785,938	22,806	3,056,004	146,510	27,250,860	30,306,864
1943	4,779,198	8,880,784	19,733	2,959,950	114,080	24,641,280	27,601,230
1944	3,890,257	9,721,473	13,944	2,231,040	91,449	20,850,372	23,081,412
1945	3,266,151	8,919,155	12,664	2,178,208	69,300	15,939,000	18,117,208
Total	6/	97,194,918	1,105,094	141,074,961	4,601,140	629,462,862	770,537,823

2/ Includes high-grade ore sold without milling and small quantities of carbonate and silicate in some years.

3/ Figures not available.

4/ Figures represent actual metal content of concentrates before deduction for smelting losses.

5/ Data not available on retreatment of old tailings in Oklahoma prior to 1926.

6/ Total 1891-1945 not available; the total for the period 1907-45, inclusive, is 147,383,920.

PRODUCTION BY SUBDISTRICTS OR CAMPS

The approximate yearly production of concentrates, by subdistricts or camps in the Tri-State district from 1898 through 1945 is shown in the following tables. The figures for 1898-1931 were compiled from tables on concentrate shipments, by camps, published in annual volumes of Mineral Resources; those for 1932-45 are a breakdown, by camps, of the district total figures published in Minerals Yearbook.

It should be borne in mind that, for the older camps, the totals obtained by adding yearly production figures for the period 1898 to 1945 do not represent their total output, as some of them had been producing steadily for many years before publication of figures showing shipments by camps began in 1898.

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Missouri Subdistrict Tables

Mine production of lead and zinc concentrates in the Alba-Neck City subdistrict 1898-1945 1/

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1898	55	$2,729	2,928	$85,179	2/	2/
1899	439	22,911	3,688	153,121	2/	2/
1900	19	936	4,086	120,443	2/	2/
1901	26	1,187	7,633	203,286	2/	2/
1902	233	9,641	7,043	225,648	2/	2/
1903	153	8,075	9,454	374,395	2/	2/
1904	157	8,755	16,997	655,795	2/	2/
1905	174	10,740	18,048	864,985	2/	2/
1906	365	28,239	25,270	1,173,936	2/	2/
1907	129	9,799	22,945	1,052,883	28	$448
1908	122	6,333	12,513	444,188	3	37
1909	159	8,308	11,482	476,588	-	-
1910	3/256	12,478	21,108	828,352	47	1,155
1911	328	19,508	15,995	707,537	-	-
1912	816	45,562	17,966	912,087	66	1,246
1913	363	19,564	16,425	700,741	116	1,656
1914	469	20,444	24,738	1,042,303	614	12,180
1915	301	14,610	15,685	1,131,720	125	5,454
1916	318	24,795	14,227	1,132,591	102	4,077
1917	389	39,593	9,001	607,099	474	17,486
1918	4	342	2,931	144,218	-	-
1919	-	-	258	9,811	-	-
1920	-	-	-	-	-	-
1921	35	1,556	4	78	-	-
1922	-	-	-	-	-	-
1923	86	7,144	179	5,737	-	-
1924	-	-	69	2,572	-	-
1925-38	-	-	-	-	-	-
1939	77	4,062	144	4,977	-	-
1940	11	627	41	1,636	-	-
1941	-	-	135	5,790	-	-
1942	15	1,740	141	9,976	-	-
1943	5	586	69	5,204	-	-
1944	-	-	116	11,633	-	-
1945	-	-	-	-	-	-
Total 1/	5,504	330,264	281,319	13,094,509	1,575	43,739

1/ The Alba-Neck City subdistrict began producing before 1898, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

2/ Carbonate and silicate included with sphalerite.

3/ Includes 1 ton lead carbonate.

Mine production of lead and zinc concentrates in the Ash Grove-Everton subdistrict 1907-45

Year	Lead concentrates				Zinc concentrates (silicate, carbonate)	
	Galena		Carbonate			
	Short tons	Value	Short tons	Value	Short tons	Value
1907	159	$7,780	20	$560	[1] 35	$935
1908	124	6,614	45	1,705	140	2,800
1909	57	2,402	-	-	50	1,003
1910	54	2,731	32	730	400	8,000
1911	51	2,646	-	-	125	2,100
1912	80	4,015	-	-	158	3,996
1913	15	750	-	-	75	1,125
1914	12	600	-	-	120	1,440
1915	25	1,400	-	-	475	23,200
1916	67	5,025	-	-	1,968	73,700
1917	8	800	-	-	1,719	52,367
1918	-	-	-	-	58	1,620
1919	-	-	-	-	-	-
1920	5	450	-	-	75	1,875
1921	-	-	-	-	-	-
1922	18	972	-	-	-	-
1923	16	960	-	-	33	660
1924-45	-	-	-	-	-	-
Total	691	37,145	97	2,995	5,431	174,821

[1] Includes 20 tons sphalerite.

Mine production of lead and zinc concentrates in the Aurora subdistrict, 1898-1945[1]

Year	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1898	596	$29,579	[2]	[2]	21,088	$428,864	[2]	[2]
1899	491	31,244	[2]	[2]	27,331	922,934	[2]	[2]
1900	705	31,221	[2]	[2]	22,197	545,820	[2]	[2]
1901	566	28,173	[2]	[2]	20,435	426,579	[2]	[2]
1902	261	21,313	[2]	[2]	19,395	521,175	[2]	[2]
1903	238	12,595	[2]	[2]	13,785	404,225	[2]	[2]
1904	263	15,195	[2]	[2]	15,611	482,605	[2]	[2]
1905	114	6,960	[2]	[2]	17,666	616,790	[2]	[2]
1906	346	26,087	[2]	[2]	15,147	539,118	[2]	[2]
1907	291	19,573	-	-	9,019	330,641	4,168	$70,237
1908[3] ...	182	10,136	2	$60	6,485	220,557	3,168	60,439
1909	323	16,524	-	-	6,858	282,603	5,496	119,333
1910	215	10,377	1	12	4,275	174,787	3,423	76,016
1911	84	4,076	24	962	3,273	122,608	1,829	37,239
1912	49	2,271	19	847	913	39,292	1,965	51,109
1913	56	2,516	13	381	331	12,332	2,139	46,608
1914	62	2,357	1	25	246	6,290	2,154	46,252
1915	306	12,187	7	242	892	81,178	3,993	178,802

Mine production of lead and zinc concentrates in the Aurora subdistrict, 1898-1945[1] (Cont'd.)

	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
Year	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1916	106	7,516	3	102	3,194	239,595	4,895	207,215
1917	229	21,337	25	1,189	3,123	209,749	4,717	176,102
1918	56	4,030	4	320	891	38,427	2,049	60,760
1919	15	818	-	-	-	-	649	17,105
1920	11	1,003	-	-	25	1,000	231	8,398
1921-23 ..	-	-	-	-	-	-	-	-
1924	-	-	-	-	8	320	23	600
1925	-	-	-	-	-	-	-	-
1926[4] ...	-	-	12	1,014	4,572	233,570	-	-
1927[5] ...	18	1,440	-	-	1,386	47,148	32	770
1928	-	-	63	3,800	-	-	-	-
1929	71	6,370	20	1,200	40	1,684	610	14,100
1930	27	1,751	-	-	35	1,010	1,475	37,017
1931[5]	5	196	-	-	-	-	229	3,219
1932	50	1,550	50	1,050	30	500	300	3,300
1933	15	600	15	450	-	-	200	3,200
1934	30	1,050	-	-	-	-	25	325
1935	-	-	25	750	-	-	80	1,280
1936	-	-	-	-	-	-	70	1,200
1937-38 ..	-	-	-	-	-	-	-	-
1939	10	550	-	-	-	-	50	850
1940	11	631	-	-	4	175	-	-
1941	3	180	1	21	85	4,585	2	40
1942	-	-	-	-	263	20,667	15	333
1943	18	1,954	-	-	1,439	123,447	-	-
1944	66	7,529	-	-	4,284	444,403	36	1,565
1945	36	3,501	-	-	4,259	452,274	-	-
Total ..	5,925	344,390	285	12,425	228,585	7,976,952	44,023	1,223,414

[1] The Aurora subdistrict began producing about 1886, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

[2] Carbonate and silicate included with galena and sphalerite.

[3] Stotts City included.

[4] Includes Bryceville and Wentworth.

[5] Includes Wentworth.

Mine production of lead and zinc concentrates in the Carl Junction subdistrict 1900-45

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1900	2	$143	2,883	$79,805
1901	177	7,990	6,723	185,817
1902	-	-	7,051	238,573
1903	11	590	5,592	201,380
1904	81	4,265	1,725	63,405
1905	-	-	62	3,100
1906	-	-	46	2,119
1907	159	11,347	992	42,916
1908	55	3,001	1,400	52,437
1909	36	1,869	1,237	50,545
1910	20	1,003	3,215	128,723
1911	69	3,696	4,610	189,127
1912	120	6,712	7,457	392,952
1913	173	8,895	10,607	440,560
1914	53	2,408	3,847	146,792
1915	44	2,515	1,359	83,391
1916	-	-	681	55,502
1917	-	-	320	24,553
1918 1/	257	23,223	5,398	324,389
1919-21	-	-	-	-
1922	2/	2/	2/	2/
1923-25	-	-	-	-
1926	2/	2/	2/	2/
1927	2	170	68	2,970
1928-30	-	-	-	-
1931 3/	121	4,900	437	7,990
1932-33	-	-	-	-
1934	5	180	150	4,000
1935-38	-	-	-	-
1939 3/	58	3,379	264	9,226
1940	65	3,625	341	13,883
1941	5	290	44	1,974
1942	90	6,991	157	11,638
1943	502	53,698	1,190	100,539
1944	366	42,789	2,626	263,737
1945	54	6,270	942	97,238
Total	2,525	199,949	71,424	3,219,281

1/ Waco included.
2/ Included in Carthage.
3/ Cave Springs included.

Mine production of lead and zinc concentrates in the Carthage subdistrict 1898-1945[1]

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1898	-	-	2,391	$64,860	2/	2/
1899	3	$166	1,725	69,648	2/	2/
1900	23	1,012	3,287	85,775	2/	2/
1901	10	471	4,283	113,488	2/	2/
1902	28	1,393	5,958	196,307	2/	2/
1903	199	10,320	6,453	130,075	2/	2/
1904	124	6,760	8,218	318,070	2/	2/
1905	11	620	5,704	272,485	2/	2/
1906	62	4,774	3,575	172,173	2/	2/
1907	13	903	2,538	106,969	-	-
1908	14	621	3,840	130,297	6	$98
1909	11	597	6,896	287,399	307	7,144
1910	57	2,869	5,661	229,552	170	3,434
1911	100	5,500	2,471	98,382	221	4,882
1912	51	2,648	3,239	150,408	28	852
1913	15	809	2,391	100,727	52	947
1914	20	957	1,889	76,139	65	1,364
1915	10	567	1,153	92,992	370	21,846
1916	72	6,006	3,835	298,950	4	153
1917	93	9,996	4,827	333,742	5	97
1918	64	5,729	6,517	399,070	11	236
1919	7	429	4,045	172,886	-	-
1920	-	-	227	12,923	-	-
1921	16	736	30	690	-	-
1922[3]	10	710	91	2,660	-	-
1923	5	400	142	5,309	-	-
1924	-	-	445	15,889	-	-
1925	25	2,600	171	6,929	-	-
1926[3]	-	-	124	5,900	-	-
1927-31	-	-	-	-	-	-
1932	-	-	27	385	-	-
1933	105	4,050	1,700	45,953	-	-
1934	-	-	1,265	33,067	-	-
1935	-	-	2,669	75,962	-	-
1936	-	-	2,057	65,660	-	-
1937	-	-	300	12,000	-	-
1938-40	-	-	-	-	-	-
1941	-	-	84	4,501	-	-
1942	1	100	421	32,744	-	-
1943	-	-	123	11,297	-	-
1944	-	-	244	24,156	-	-
1945	7	731	174	15,085	-	-
Total[1] ..	1,156	72,474	101,190	4,271,504	1,239	41,053

1/ The Carthage subdistrict began producing about 1876 but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

2/ Carbonate and silicate included with galena and sphalerite.

3/ Includes Carl Junction. 4/ Includes Fidelity.

Mine production of lead and zinc concentrates in the Cave Springs-Central City subdistrict 1898-1945 1/

Year	Subdistrict	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
		Short tons	Value	Short tons	Value
1898	Central City	583	$28,934	9,637	$263,126
1899	Cave Springs	54	3,120	1,163	40,576
1899	Central City	386	20,504	9,172	355,185
1900	Cave Springs	234	9,994	3,882	103,530
1900	Central City	579	28,827	7,533	194,871
1901	Cave Springs	364	16,863	3,804	97,229
1901	Central City	481	22,473	7,084	161,848
1902	Cave Springs	242	11,212	4,594	142,559
1902	Central City	234	11,198	3,630	94,172
1903	Cave Springs	295	15,870	2,410	87,230
1903	Central City	263	14,455	2,813	88,185
1904	Cave Springs	129	6,830	902	30,195
1904	Central City	157	8,790	1,171	34,370
1905	Cave Springs	-	-	63	2,700
1905	Central City	9	550	1,167	51,850
1906	Cave Springs				
1906	Central City	12	910	1,151	49,841
1907	Cave Springs	40	2,126	779	30,429
1908	Cave Springs	29	1,723	1,942	66,909
1909	Cave Springs	39	2,002	2,639	111,200
1910	Cave Springs	56	2,814	1,761	66,019
1911	Cave Springs	317	18,469	4,497	196,994
1912	Cave Springs	384	21,454	5,979	316,724
1913	Cave Springs	181	9,218	3,331	144,810
1914	Cave Springs	105	4,640	2,652	112,602
1915	Cave Springs	77	4,006	2,191	185,242
1916	Cave Springs	412	32,717	2,595	225,062
1917	Cave Springs	209	22,450	1,603	123,661
1918	Cave Springs	47	3,851	1,237	63,690
1919	Cave Springs	2/	2/	2/	2/
1920 3/	Cave Springs	58	5,309	1,421	58,567
1921 3/	Cave Springs	30	1,286	116	2,608
1922-30	Cave Springs	-	-	-	-
1931	Cave Springs	4/	4/	4/	4/
1932-38	Cave Springs	-	-	-	-
1939	Cave Springs	4/	4/	4/	4/
1940-45	Cave Springs	-	-	-	-
Total 1/		6,006	332,595	92,919	3,501,984

1/ The Cave Springs-Central City subdistrict began producing before 1898, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

2/ Included in zincite.

3/ Includes Bellville.

4/ Included in Carl Junction.

Mine production of lead and zinc concentrates in the Christian, Greene, and Ozark Counties, 1914-45

Year	Subdistrict	Lead concentrates (galena)		Zinc concentrates			
				Sphalerite		Silicate, carbonate	
		Short tons	Value	Short tons	Value	Short tons	Value
1914 ..	Christian (inc. Ozark)	-	-	-	-	1,844	$20,079
1915 ..	Christian-Ozark	1/	1/	1/	1/	1/	1/
1916 ..	Christian County	94	$6,600	100	$6,000	734	29,827
1917 ..	Christian County	49	5,233	52	2,578	520	20,289
1918 ..	Christian County2/	18	1,600	37	1,800	25	800
1919 ..		-	-	-	-	-	-
1920 ..	Ozark County	3/	3/	3/	3/	3/	3/
1921 ..		-	-	-	-	-	-
1922 ..	Christian County	4/	4/	4/	4/	4/	4/
1923 ..	Christian County	5/	5/	5/	5/	5/	5/
1924 ..	Christian County	17	2,027	-	-	-	-
1925 ..	Ozark County	5/	5/	5/	5/	5/	5/
1926-27		-	-	-	-	-	-
1928 ..	Greene County	15	1,200	-	-	-	-
1929-32		-	-	-	-	-	-
1933 ..	Christian-Greene-Ozark6/	16	700	150	3,200	75	1,125
1934 ..	Christian-Greene-Ozark	23	780	-	-	133	1,729
1935 ..	Christian-Greene-Ozark	-	-	-	-	388	5,213
1936 ..		-	-	-	-	-	-
1937 ..	Christian-Greene-Ozark	15	1,009	228	9,387	27	324
1938 ..	Christian-Greene-Ozark	-	-	744	22,320	-	-
1939 ..	Christian-Greene-Ozark	-	-	592	18,827	248	4,960
1940 ..	Christian-Greene-Ozark	-	-	750	30,750	669	7,911
1941 ..	Christian-Greene-Ozark	-	-	714	36,386	317	3,410
1942 ..	Christian-Ozark	-	-	479	26,609	277	2,200
1943 ..	Christian-Ozark	-	-	110	10,318	254	2,800
1944 ..	Christian-Ozark	3	347	272	9,837	-	-
1945 ..	Christian-Ozark	1	54	169	8,627	90	1,232
Total		251	19,550	4,397	186,639	5,601	101,899

1/ Included in Taney County.
2/ Includes Wright County.
3/ Included in Howell County.
4/ Included in Stark City.
5/ Included in Hickory County.
6/ Includes Hickory County.

Mine production of lead and zinc concentrates in the Diamond subdistrict, 1904-45

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1904	12	$700	951	$35,250	-	-
1905	-	-	425	19,665	-	-
1906	-	-	44	1,824	-	-
1907-15 ..	-	-	-	-	-	-
1916	2	180	306	25,132	256	$11,327
1917	-	9	798	62,630	98	4,731
1918-20 ..	1/	1/	1/	1/	1/	1/
1921-30 ..	-	-	-	-	-	-
1931	1/	1/	1/	1/	1/	1/
1932	-	-	-	-	-	-
1933-35 ..	2/	2/	2/	2/	2/	2/
1936	-	-	-	-	-	-
1937-38 ..	2/	2/	2/	2/	2/	2/
1939-40 ..	-	-	-	-	-	-
1941	2/	2/	2/	2/	2/	2/
1942	-	-	50	3,612	-	-
1943	-	-	236	17,002	-	-
1944	-	-	8	651	-	-
1945	-	-	-	-	-	-
Total ..	14	889	2,818	165,766	354	16,058

1/ Included in Granby district.
2/ Included in Wentworth district.

Mine production of lead and zinc concentrates in the Duenweg-Porto Rico subdistrict, 1898-1945 1/

Year	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1898	2,194	$108,888	2/	2/	14,406	$342,984	2/	2/
1899	1,272	70,534	2/	2/	8,969	347,497	2/	2/
1900	823	36,268	2/	2/	5,147	124,268	2/	2/
1901	1,479	67,886	2/	2/	4,235	102,855	2/	2/
1902	1,640	75,775	2/	2/	13,679	596,628	2/	2/
1903	3,010	161,695	2/	2/	17,600	612,515	2/	2/
1904	1,480	77,128	2/	2/	1,442	53,088	2/	2/
1905	3,258	202,515	2/	2/	15,300	954,760	2/	2/
1906	3,963	314,388	2/	2/	17,984	793,500	2/	2/
1907	2,812	200,026	170	$5,875	17,378	721,034	500	$10,172
1908	5,030	119,721	61	1,654	16,413	596,795	1,760	36,947
1909	3,335	176,191	19	492	18,721	754,028	2,497	62,069

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Mine production of lead and zinc concentrates in the Duenweg-Porto Rico subdistrict, 1898-1945[1] (Cont'd.)

Year	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1910	3,179	159,781	5	197	19,731	772,145	2,075	49,289
1911	2,397	133,201	-	-	16,550	649,829	2,552	65,860
1912	2,747	151,985	35	1,241	21,728	1,087,730	1,325	37,707
1913	4,051	202,938	4	123	20,075	824,867	1,991	37,693
1914	3,176	145,574	30	878	19,526	760,790	169	3,058
1915	3,120	170,998	-	-	27,789	2,285,151	1,507	70,161
1916	6,538	532,995	-	-	40,709	3,354,375	1,302	73,954
1917	6,010	602,569	354	28,129	38,093	2,628,085	3,057	150,149
1918	2,152	186,400	5	273	13,983	680,960	2,431	82,267
1919	529	33,428	12	402	2,540	111,151	3,183	94,314
1920	163	16,342	-	-	680	29,515	1,561	51,672
1921	62	2,540	-	-	4	105	9	56
1922	71	4,549	72	3,845	280	8,501	929	19,990
1923	74	6,100	3	180	120	4,800	308	7,685
1924	11	1,100	-	-	152	4,346	9	260
1925	385	45,162	-	-	413	20,657	450	14,000
1926	1,238	136,180	-	-	50	2,300	772	24,366
1927	1,225	110,100	-	-	57	2,210	162	4,860
1928	24	1,963	1	61	-	-	300	6,356
1929	2	170	4	250	-	-	221	4,600
1930	50	3,500	50	3,000	-	-	-	-
1931-34 ...	-	-	-	-	-	-	-	-
1935	44	1,660	-	-	-	-	-	-
1936	-	-	-	-	-	-	-	-
1937	-	-	-	-	-	-	326	9,150
1938	45	2,452	30	888	707	20,997	-	-
1939	29	1,556	-	-	98	3,500	-	-
1940	33	2,078	-	-	169	6,561	-	-
1941	15	990	12	624	135	6,237	39	557
1942	1	89	-	-	320	22,395	10	230
1943	213	27,760	-	-	6,406	711,063	-	-
1944	216	24,130	-	-	6,720	805,709	-	-
1945	227	30,873	-	-	3,296	437,569	-	-
Total[1] .	68,323	4,350,178	867	48,112	391,605	21,241,500	29,445	917,422

[1] The Duenweg-Porto Rico subdistrict began producing about 1851, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

[2] Carbonate and silicate included with galena and sphalerite.

Mine production of lead and zinc concentrates in the Webb City-Carterville-Prosperity subdistrict, 1898-1945[1]

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1898	5,218	$258,969	37,715	$935,775
1899	5,698	327,029	42,271	1,658,713
1900	8,416	407,327	51,789	1,396,623
1901	9,612	445,189	58,089	1,385,523
1902	10,300	480,539	55,622	1,567,317
1903	10,615	586,915	50,637	1,741,510
1904	16,508	915,879	93,377	3,510,969
1905	16,699	1,026,355	64,047	2,877,855
1906	20,016	1,561,234	68,670	3,038,313
1907	22,206	1,610,028	82,496	3,287,105
1908	19,726	1,057,435	80,333	2,657,508
1909	24,375	1,318,698	109,315	4,528,517
1910	22,772	1,206,676	104,788	4,258,887
1911	24,626	1,396,167	93,462	3,718,617
1912	24,115	1,349,251	2/101,657	5,173,530
1913	21,771	1,125,324	77,469	3,173,220
1914	17,396	827,926	64,089	2,414,476
1915	20,476	1,061,617	103,923	7,787,651
1916	22,231	1,930,295	113,835	9,751,555
1917	20,650	2,152,772	86,415	6,230,272
1918	9,292	861,277	27,210	1,307,797
1919	3,642	252,718	5,871	194,483
1920	2,083	218,351	3,714	148,066
1921	790	40,646	281	5,366
1922	593	42,114	607	15,870
1923	551	45,746	248	7,658
1924	285	31,375	449	13,369
1925	492	57,669	157	6,489
1926	360	36,494	412	13,302
1927	180	15,202	146	3,325
1928	150	11,572	140	3,868
1929	203	17,781	74	2,520
1930	493	32,046	79	1,694
1931	148	7,460	180	2,839
1932	66	2,025	127	1,865
1933	132	4,865	559	13,621
1934	24	885	673	15,584
1935	2	66	2/364	9,161
1936	12	527	62	1,432
1937	3/273	15,686	4,197	180,844
1938	725	36,406	4,512	135,688
1939	776	43,673	1,258	37,180

Mine production of lead and zinc concentrates in the Webb City Carterville-Prosperity subdistrict, 1898-1945[1] (Cont'd.)

Year	Lead concentrates (galena)		Zinc concentrates (sphalertie)	
	Short tons	Value	Short tons	Value
1940	184	$10,698	712	$28,301
1941	568	35,028	2,254	102,883
1942	[3]51	5,006	2,314	169,945
1943	398	46,444	3,722	354,521
1944	506	54,716	3,679	316,263
1945	242	26,104	699	41,529
Total[1]	366,647	22,998,205	1,604,699	74,229,399

[1] The Webb City-Carterville-Prosperity subdistricts began producing lead about 1851 and zinc about 1874, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

[2] Includes some silicate and carbonate.

[3] Includes some lead carbonate.

Mine production of lead and zinc concentrates in the Oronogo subdistrict, 1898-1945[1]

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1898	429	$21,291	16,730	$461,822	[2]	[2]
1899	206	10,686	21,886	887,265	[2]	[2]
1900	159	7,291	18,473	511,873	[2]	[2]
1901	877	39,193	16,480	408,030	[2]	[2]
1902	477	21,767	9,225	278,575	[2]	[2]
1903	221	11,100	7,507	257,995	[2]	[2]
1904	-	-	-	-	-	-
1905	319	19,850	6,831	322,230	[2]	[2]
1906	354	27,403	8,768	382,558	[2]	[2]
1907	584	38,981	10,601	468,014	-	-
1908	466	23,411	9,391	329,292	-	-
1909	951	52,580	8,013	320,922	-	-
1910	1,327	71,360	8,382	344,679	-	-
1911	1,491	82,993	10,173	425,680	-	-
1912	1,719	91,649	11,015	510,904	-	-
1913	1,449	74,069	12,023	478,154	-	-
1914	1,670	78,988	9,472	391,334	-	-
1915	2,135	117,931	12,834	1,030,047	-	-
1916	3,062	259,150	11,300	830,025	-	-
1917	2,331	228,801	9,918	642,602	-	-
1918	1,618	143,903	7,439	342,998	-	-
1919	1,640	106,184	7,909	280,153	-	-

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Mine production of lead and zinc concentrates in the Oronogo subdistrict, 1898-1945[1] (Cont'd.)

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1920	1,700	164,344	7,870	$327,534	-	-
1921	143	7,693	91	1,950	-	-
1922	672	46,481	5,263	132,362	4	$105
1923	449	38,311	2,537	69,584	-	-
1924	260	25,374	164	6,630	35	653
1925	184	19,210	127	4,126	2	55
1926	139	12,090	129	4,047	3	87
1927	147	10,057	-	-	-	-
1928	161	10,702	5	127	1	18
1929	68	5,438	2	31	-	-
1930	133	7,393	-	-	6	86
1931	173	6,528	-	-	-	-
1932	[3]232	5,248	33	522	4	28
1933	253	9,823	27	520	400	6,000
1934	[3]83	2,779	1	25	4	39
1935	144	6,146	1,291	42,922	-	-
1936	[3]1,997	98,978	22,709	743,816	-	-
1937	3,319	226,200	21,328	930,379	-	-
1938	651	32,427	4,008	126,244	-	-
1939[4]	1,734	94,304	13,209	457,712	-	-
1940[4]	1,729	97,531	12,954	552,050	-	-
1941	648	35,804	15,630	794,128	-	-
1942	780	72,471	24,846	1,742,716	-	-
1943	1,721	179,179	16,237	1,575,149	-	-
1944	1,479	165,136	23,303	2,196,100	-	-
1945	1,666	185,206	12,880	1,302,819	-	-
Total[1] ...	44,150	3,093,434	419,014	20,916,645	459	7,071

[1] The Oronogo subdistrict began producing about 1851, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

[2] Carbonate and silicate included with sphalerite.

[3] Includes some lead carbonate.

[4] North Webb City included.

Mine production of lead and zinc concentrates in the Fairview, McDowell, and Pioneer subdistricts, 1909-45

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1909	5	$300	45	$1,710	-	-
1910-11	-	-	-	-	-	-
1912	-	-	152	7,604	-	-
1913-15	-	-	-	-	-	-
1916	-	-	35	2,600	111	$6,069
1917	5	500	-	-	50	1,850
1918-36	-	-	-	-	-	-
1937	-	-	129	4,510	-	-
1938	-	-	309	9,027	-	-
1939-45	-	-	-	-	-	-
Total	10	800	670	25,451	161	7,919

Mine production of lead and zinc concentrates in the Granby subdistrict, 1898-1945[1]

Year	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1898	630	$31,267	[2]	[2]	9,666	$144,974	[2]	[2]
1899	414	34,473	[2]	[2]	6,691	235,691	[2]	[2]
1900	499	22,560	[2]	[2]	7,838	182,213	[2]	[2]
1901	1,075	47,360	[2]	[2]	7,941	137,456	[2]	[2]
1902	1,089	50,434	[2]	[2]	8,459	181,347	[2]	[2]
1903	809	44,140	[2]	[2]	8,067	193,285	[2]	[2]
1904	1,249	69,815	[2]	[2]	12,335	311,555	[2]	[2]
1905	874	53,565	[2]	[2]	10,974	306,940	[2]	[2]
1906	985	76,643	[2]	[2]	10,895	341,120	[2]	[2]
1907	1,340	96.418	57	$1,375	2,535	113,760	11,006	$297,135
1908	474	25,375	81	1,454	4,325	151,668	8,622	197,598
1909	322	16,361	67	1,340	3,534	147,739	11,007	287,689
1910	393	19,341	26	749	5,206	191,739	9,310	240,657
1911	623	33,824	43	1,636	4,330	152,662	9,405	239,194
1912	306	16,475	66	2,624	3,109	143,903	9,913	321,877
1913	388	19,519	168	5,608	3,234	122,996	10,708	269,133
1914	359	16,470	29	767	4,812	197,042	10,398	246,280
1915	222	9,625	85	3,088	7,587	511,169	10,923	586,116
1916	308	19,488	-	-	6,924	662,695	9,310	573,689
1917	540	47,611	-	-	6,126	413,491	15,828	656,561
1918[3] ..	387	30,133	-	-	5,171	266,656	11,737	381,781
1919[3] ..	351	19,576	-	-	2,249	82,774	6,718	177,605
1920[3] ..	258	20,134	-	-	872	33,110	6,769	250,202
1921	-	-	-	-	-	-	-	-
1922	257	17,778	-	-	222	8,119	1,836	39,112

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Mine production of lead and zinc concentrates in the Granby subdistrict, 1898-1945[1] (Cont'd.)

	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
Year	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1923	596	$50,273	-	-	553	$21,252	2,865	$77,110
1924	336	29,192	-	-	154	5,572	1,006	24,084
1925	473	48,435	-	-	1,000	49,095	954	29,296
1926	481	48,220	-	-	6,186	290,912	1,036	35,183
1927	235	17,085	-	-	228	9,594	583	15,303
1928	151	10,260	-	-	-	-	130	2,742
1929	114	8,397	-	-	-	-	113	1,948
1930	81	4,206	-	-	-	-	208	3,435
1931[3] ..	126	5,307	90	$2,985	606	11,790	30	357
1932	37	1,225	39	893	-	-	40	320
1933	350	12,530	292	9,300	-	-	407	6,068
1934	258	9,192	261	6,553	-	-	749	11,596
1935	-	-	20	600	-	-	500	8,000
1936	269	9,250	70	2,257	360	[4]	473	8,162
1937	9	582	104	5,331	81	1,684	1,123	27,937
1938	1	47	44	1,324	-	-	857	15,131
1939	97	3,381	-	-	47	1,001	651	10,947
1940	28	1,134	57	2,446	221	4,625	59	921
1941	10	598	77	3,734	919	49,900	919	10,348
1942	288	33,837	9	464	7,961	496,024	1,188	20,733
1943	679	91,179	-	-	4,933	609,838	282	10,134
1944	545	86,886	9	855	6,121	834,515	128	5,118
1945	824	133,542	-	-	4,420	624,300	-	-
Total[1]	20,140	1,443,143	1,694	55,383	176,892	8,244,206	157,791	5,089,502

[1] The Granby subdistrict began producing about 1850, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

[2] Carbonate and silicate included with galena and sphalerite.

[3] Includes Diamond subdistrict.

[4] Value included under lead.

Mine production of lead and zinc concentrates in Hickory, Howell, Taney, and Wright Counties, 1912-45

		Lead concentrates (galena)		Zinc concentrates			
				Sphalerite		Silicate, carbonate	
Year	Subdistrict	Short tons	Value	Short tons	Value	Short tons	Value
1912 ..	Howell County (Wetherill dist.)	-	-	-	-	1,297	$25,840
1913 ..	Taney County (includes Wetherill dist.)	-	-	-	-	1,130	19,098
1914 ..		-	-	-	-	-	-
1915 ..	Taney County (includes Christian and Ozark Counties)	-	-	2	$100	280	9,460
1916 ..	Taney County (includes Ozark, Howell, and Wright)	-	-	13	780	582	14,867
1917 ..	Taney County (includes Ozark, Howell, and Wright)	1	$72	7	417	507	12,424
1918 ..		-	-	-	-	-	-
1919 ..	Wright County (includes Barry County)	20	1,400	80	3,082	35	1,000
1920 ..	Howell County (includes Ozark and Wright)	-	-	-	-	86	2,780
1921-22		-	-	-	-	-	-
1923 ..	Hickory County (includes Christian)	48	4,020	-	-	7	140
1924 ..		-	-	-	-	-	-
1925 ..	Hickory County (includes Ozark and Barry)	22	2,422	2,249	134,131	45	1,400
1926 ..	Hickory County (includes Dade County)	43	4,400	-	-	40	800
1927 ..	Hickory County (includes Dade County)	10	850	-	-	30	1,050
1928 ..		-	-	-	-	-	-
1929 ..	Taney County	5	425	-	-	-	-
1930 ..		-	-	-	-	-	-
1931 ..	Hickory County (includes Wetherill dist. and Linn Creek in Camden County)	65	2,615	2	35	-	-
1932 ..		-	-	-	-	-	-
1933 ..	Hickory County	1/	1/	1/	1/	1/	1/
1934-45		-	-	-	-	-	-
Total		214	16,204	2,353	138,545	4,039	88,859

1/ Included in Christian, Greene, and Ozark Counties.

Mine production of lead and zinc concentrates in the Joplin subdistrict, 1898-1945[1]

Year	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1898	8,329	$413,368	[2]	[2]	37,168	$986,939	[2]	[2]
1899	6,712	372,947	[2]	[2]	45,367	1,864,351	[2]	[2]
1900	11,489	557,643	[2]	[2]	54,876	1,536,374	[2]	[2]
1901	12,227	566,157	[2]	[2]	67,232	1,795,573	[2]	[2]
1902	10,206	473,042	[2]	[2]	73,690	2,418,737	[2]	[2]
1903	8,084	431,130	[2]	[2]	63,870	2,436,465	[2]	[2]
1904	8,732	483,829	[2]	[2]	72,428	2,796,923	[2]	[2]
1905	6,291	388,040	[2]	[2]	70,481	3,404,980	[2]	[2]
1906	6,814	531,288	[2]	[2]	68,744	3,112,483	[2]	[2]
1907	7,004	477,081	24	$684	60,139	2,537,771	216	$3,671
1908	6,833	353,798	153	4,893	51,359	1,773,359	1,462	27,132
1909	6,408	337,782	113	3,461	45,963	1,913,835	1,220	25,279
1910	6,062	305,209	51	1,643	47,200	1,908,749	1,403	27,672
1911	6,158	325,885	45	1,512	41,300	1,650,091	1,707	36,488
1912	4,689	252,085	19	653	43,032	2,151,198	2,520	71,592
1913	3,963	212,005	106	3,488	42,061	1,775,228	1,457	26,651
1914	4,407	201,573	93	2,089	36,437	1,403,476	2,080	42,063
1915	6,085	325,731	20	392	49,074	3,825,971	3,460	149,092
1916	5,949	492,383	2	97	51,259	4,279,912	3,339	154,907
1917	7,072	704,389	7	387	52,525	3,920,729	1,532	67,356
1918	2,117	181,240	-	-	17,025	919,891	741	23,113
1919	923	59,259	-	-	10,597	432,850	853	22,591
1920	337	31,394	-	-	2,530	114,716	466	14,572
1921	396	20,461	33	1,090	139	3,706	32	355
1922	266	19,308	91	5,505	161	5,559	119	2,310
1923	829	69,338	116	8,120	1,281	50,116	518	13,858
1924	1,391	144,862	165	13,200	852	32,834	330	8,447
1925[3] ..	1,169	130,733	277	23,510	8,541	456,262	390	12,100
1926	1,595	167,162	147	12,500	6,201	261,409	818	28,346
1927	559	45,072	200	12,000	2,117	79,870	343	8,724
1928	684	53,248	100	5,979	2,958	109,550	93	2,255
1929	659	55,004	100	6,000	1,661	66,496	4	80
1930	253	13,692	107	5,356	3,054	109,937	-	-
1931	437	16,758	200	6,500	167	3,143	118	1,184
1932	564	16,870	425	10,500	381	6,127	-	-
1933	161	5,936	-	-	3,496	105,445	3	34
1934	252	9,044	84	2,497	5,782	159,242	201	2,762
1935	168	5,743	300	9,000	5,572	157,816	200	3,200
1936	6	298	74	3,140	6,823	210,013	78	1,400
1937	775	52,140	39	2,235	7,551	312,425	-	-
1938	666	33,348	30	888	3,266	94,533	165	2,800
1939	720	40,379	-	-	2,470	86,082	-	-

Mine production of lead and zinc concentrates in the Joplin subdistrict, 1898-1945 1/ (Cont'd.)

	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
Year	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1940	706	$39,674	-	-	2,039	$88,678	-	-
1941	594	37,415	-	-	1,962	88,946	-	-
1942	1,254	147,562	6	$240	9,890	780,021	20	$444
1943	3,804	465,781	-	-	8,612	846,053	-	-
1944	3,006	358,100	-	-	8,952	968,848	-	-
1945	1,495	231,029	-	-	6,845	774,029	-	-
Total 1/	169,300	10,656,215	3,127	147,559	1,205,130	54,817,741	25,888	780,478

1/ The Joplin subdistrict began producing about 1850, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

2/ Carbonate and silicate included with galena and sphalerite.

3/ Includes Smithfield.

Mine production of lead and zinc concentrates in the Mitchell-Sherwood-Thoms Station subdistricts, 1904-45

	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
Year	Short tons	Value	Short tons	Value
1904	301	$16,430	2,993	$120,010
1905	103	6,275	1,996	94,155
1906	339	26,141	2,306	106,186
1907	131	7,929	1,268	45,016
1908	46	2,496	644	20,210
1909	220	12,235	950	41,278
1910	353	17,548	2,247	98,233
1911	641	35,382	12,603	443,822
1912	952	51,953	17,226	857,883
1913	1,432	75,480	21,700	774,180
1914	846	39,217	1/9,554	327,154
1915	555	31,863	4,813	349,846
1916	615	52,692	4,721	310,287
1917	271	27,761	1/1,530	105,491
1918	22	1,913	942	57,331
1919-24	-	-	-	-
1925	28	3,242	1,275	58,666
1926	-	-	-	-
1927	325	24,802	6,393	209,109
1928	2/	2/	2/	2/
1929-45 3/	-	-	-	-
Total 3/	7,180	433,359	93,161	4,018,857

1/ Includes a small amount of carbonate.

2/ Small production from Thoms Station included in Smithfield subdistrict.

3/ Thoms Station district included in Carl Junction district in 1941-45; production 1930-40 very small and not given separately.

Mine production of lead and zinc concentrates in the Sarcoxie-Reeds subdistrict, 1904-45

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1904	6	$340	1,015	$36,045	1/	1/
1905	-	-	694	31,040	1/	1/
1906	-	-	317	13,472	1/	1/
1907	-	-	1,970	76,072	36	$720
1908	1	50	2,616	104,484	275	5,700
1909	-	-	3,044	116,969	2,480	63,820
1910	24	1,249	2,427	96,736	2,049	42,715
1911	2/ 14	580	1,836	70,627	990	21,447
1912	-	-	342	19,328	255	7,490
1913	-	-	1,719	71,451	490	10,000
1914	-	-	941	39,465	185	4,000
1915	1	25	2,002	151,563	251	12,030
1916	1	64	4,856	329,467	130	5,300
1917	-	-	1,542	109,212	-	-
1918	-	-	1,155	72,750	120	3,600
1919	-	-	25	1,403	-	-
1920-45	-	-	-	-	-	-
Total	47	2,308	26,501	1,340,084	7,261	176,822

1/ Carbonate and silicate included with sphalerite.

2/ Includes 6 tons carbonate.

Mine production of lead and zinc concentrates in the Spring City-Beef Branch, Seneca, and Spurgeon subdistricts, 1901-45

Year	Subdistrict	Lead concentrates				Zinc concentrates			
		Galena		Carbonate		Sphalerite		Silicate, carbonate	
		Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1901	Spring City	1,883	$86,327	1/	1/	4,512	$103,858	1/	1/
1902	Spring City and Spurgeon	1,159	52,030	1/	1/	4,383	104,268	1/	1/
1903	Spring City and Spurgeon	916	47,680	1/	1/	2,751	75,760	1/	1/
1904	Spring City and Spurgeon	550	27,865	1/	1/	1,980	53,982	1/	1/
1904	Beef Branch	818	34,580	1/	1/	1,185	25,765	1/	1/
1905	Spring City and Spurgeon	142	8,790	1/	1/	2,723	89,165	1/	1/
1905	Beef Branch	335	18,940	1/	1/	1,635	37,665	1/	1/
1906	Spring City Spurgeon and Beef Branch	870	62,822	1/	1/	5,691	190,663	1/	1/
1907	Spring City	957	73,696	86	$3,270	3,536	131,628	1,076	$18,391
1907	Spurgeon	608	38,594	-	-	1,939	82,407	514	9,462
1908	Spring City	1,172	68,274	161	4,968	968	33,367	3,510	64,652
1908	Spurgeon	606	31,023	161	3,486	1,993	61,560	959	20,144
1909	Spring City	1,357	75,156	92	2,633	2,530	95,126	2,916	63,128
1909	Spurgeon	658	34,586	94	3,198	1,706	64,460	953	23,349
1910	Spring City	1,241	64,707	41	1,520	2,468	84,441	3,082	73,573
1910	Spurgeon	757	37,638	40	1,516	224	7,838	589	13,648
1911	Spring City	725	36,974	10	293	2,350	74,946	2,372	50,306
1911	Spurgeon	868	48,614	106	3,775	80	2,700	400	8,137
1912	Spring City	766	42,005	153	4,629	2,354	93,164	3,146	86,207
1912	Spurgeon	580	30,257	69	2,829	593	29,743	33	784
1913	Spring City	1,839	88,597	32	948	2,952	91,178	2,043	42,231
1913	Spurgeon	146	6,580	-	-	1,671	73,759	1	30
1914	Spring City	1,416	63,916	42	959	3,581	120,973	1,397	24,585
1914	Spurgeon	144	6,306	-	-	1,223	43,499	7	148
1915	Spring City	568	29,846	100	3,175	1,964	142,104	2,388	121,609
1915	Spurgeon	78	3,755	3	103	1,291	77,717	2	85
1916	Spring City	340	27,492	22	1,461	334	65,187	1,723	92,646
1916	Spurgeon and Seneca	240	18,866	-	-	2,240	141,262	311	14,904
1917	Spring City	387	42,113	3	107	294	20,434	1,379	56,589
1917	Spurgeon and Seneca	138	13,287	5	275	2,702	161,038	419	17,063
1918	Spring City	95	6,839	-	-	-	-	214	9,889
1918	Spurgeon and Seneca	95	8,065	-	-	957	48,796	195	3,225
1919	Spring City	-	-	5	204	-	-	64	1,517
1919	Spurgeon and Seneca	67	3,758	-	-	127	4,902	8	145
1920	Spring City and Spurgeon	32	3,358	20	1,034	5	186	25	972
1921	Spurgeon and Seneca	93	5,194	1	24	-	-	19	223

Mine production of lead and zinc concentrates in the Spring City-Beef Branch, Seneca, and Spurgeon subdistricts, 1901-45 (Cont'd.)

		Lead concentrates				Zinc concentrates			
		Galena		Carbonate		Sphalerite		Silicate, carbonate	
Year	Subdistrict	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1922	Spring City and Spurgeon	32	$1,911	10	$400	-	-	-	-
1923	Spring City	90	7,650	77	5,340	-	-	20	$400
1923	Spurgeon and Seneca2/	33	2,640	-	-	-	-	5	110
1924	Spring City Spurgeon and Seneca	215	20,119	115	8,852	-	-	50	1,250
1925	Spring City and Spurgeon	254	27,749	109	9,581	-	-	428	13,023
1926	Spring City and Seneca	122	13,398	33	1,629	10	$400	1,000	27,200
1927	Spring City and Spurgeon	73	6,192	100	6,000	-	-	207	4,925
1928	Spring City and Spurgeon	120	9,065	-	-	-	-	463	9,322
1929	Spring City and Spurgeon	140	10,012	30	2,000	-	-	404	7,982
1930	Spring City Spurgeon and Seneca	83	4,896	50	2,700	-	-	7	160
1931	Spurgeon and Seneca	150	6,500	150	4,500	-	-	-	-
1932		-	-	-	-	-	-	-	-
1933	Spring City	-	-	-	-	-	-	60	960
1934		-	-	-	-	-	-	-	-
1935	Spring City and Spurgeon	50	2,010	-	-	-	-	-	-
1936	Spurgeon	90	4,500	-	-	683	21,935	-	-
1937	Spring City and Spurgeon	715	40,861	-	-	952	36,008	214	6,000
1938	Spring City Spurgeon and Seneca	1,463	75,378	-	-	1,252	36,787	-	-
1939	Spring City	113	5,658	-	-	1,536	55,201	-	-
1940	Spring City and Spurgeon	-	-	-	-	148	5,920	-	-
1941	Spring City and Spurgeon	20	1,200	-	-	450	20,475	-	-
1942	Spring City and Spurgeon	6	650	-	-	-	-	-	-
1943	Spurgeon	20	2,271	-	-	12	1,434	-	-
1944	Spring City and Spurgeon	6	700	-	-	-	-	-	-
1945	Spurgeon	2	208	-	-	64	5,167	-	-
Total		26,443	1,492,098	1,920	81,409	70,549	2,616,868	32,603	888,974

1/ Carbonate and silicate included with galena and sphalerite.

2/ Includes Racine.

Mine production of lead and zinc concentrates in the Springfield subdistrict, 1898-1945[1]

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1898	39	$1,936	442	$10,506
1899-1905	-	-	-	-
1906	44	3,608	324	14,672
1907	346	25,417	882	39,127
1908	216	11,755	1,890	76,888
1909	164	8,351	1,480	65,401
1910[2]	38	2,150	[3]301	8,443
1911	230	12,203	900	38,006
1912	227	13,421	1,777	106,900
1913	56	3,043	650	30,000
1914	256	12,325	1,898	85,117
1915	196	9,546	1,402	92,425
1916	272	20,086	2,005	156,169
1917	172	10,579	1,583	118,478
1918	186	17,214	452	22,738
1919	304	21,793	650	30,024
1920	-	-	[3]275	15,330
1921-23	-	-	-	-
1924	-	-	156	6,240
1925-32	-	-	-	-
1933[4]	[4]	[4]	[4]	[4]
1934-45	-	-	-	-
Total	2,746	173,427	17,067	916,464

[1] The Springfield subdistrict began producing about 1857, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

[2] Includes total production of several mines in Barry, Greene, and Howell Counties to avoid disclosure of individual production.

[3] Includes small amount of carbonate.

[4] Included in Ozark-Christian-Greene County.

Mine production of lead and zinc concentrates in the Stark City subdistrict, 1915-45

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1915[1]	4	$265	16	$1,800	15	$900
1916[1]	51	4,600	300	27,000	137	6,617
1917[1]	5	400	-	-	30	1,022
1918[1]	8	853	19	765	-	-
1919-20	-	-	-	-	-	-
1921	20	1,050	-	-	-	-
1922[2]	8	585	80	2,800	120	2,400
1923[3]	10	800	-	-	18	309
1924	[4]16	1,504	-	-	-	-
1925-36	-	-	-	-	-	-
1937	13	949	44	2,089	-	-
1938	3	135	381	12,290	-	-
1939	47	2,522	5,939	199,047	-	-
1940	6	361	2,836	119,550	-	-
1941	156	10,122	2,945	146,897	-	-
1942	-	-	-	-	-	-
1943	-	-	-	-	501	38,327
1944	-	-	-	-	2,289	211,334
1945	-	-	-	-	516	43,368
Total	347	24,146	12,560	512,238	3,626	304,277

[1] Includes McDowell.

[2] Includes Christian County.

[3] Includes Wentworth.

[4] Includes 2 tons lead carbonate.

Mine production of lead and zinc concentrates in the Stotts City subdistrict, 1898-1945 1/

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1898	200	$9,926	6,539	$181,400
1899	197	10,322	6,420	271,738
1900	91	4,322	3,716	110,587
1901	46	2,138	1,124	30,226
1902	-	-	1,431	43,035
1903	-	-	338	11,710
1904	16	910	210	8,445
1905	88	660	579	33,325
1906	20	1,524	1,161	51,638
1907	8	560	1,062	47,860
1908	2/	2/	2/	2/
1909	11	656	677	26,694
1910	15	759	841	32,484
1911	44	2,400	820	35,472
1912	8	440	250	12,624
1913-14	3/	3/	3/	3/
1915	-	-	-	-
1916	-	-	573	48,324
1917	-	-	604	45,465
1918-30	-	-	-	-
1931	29	1,409	257	6,825
1932	-	-	-	-
1933	10	400	200	6,000
1934	200	7,700	1,450	42,000
1935	-	-	110	2,900
1936-40	-	-	-	-
1941	14	952	455	23,031
1942	42	4,667	1,399	104,353
1943	-	-	442	66,224
1944	-	-	482	70,372
1945	-	-	104	14,959
Total 1/	1,039	49,745	31,244	1,327,691

1/ The Stotts City subdistrict began producing before 1898, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

2/ Included in Aurora.

3/ Included in Wentworth.

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Mine production of lead and zinc concentrates in the Missouri part of the Waco subdistrict, 1918-45

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1918	1/	1/	1/	1/
1919	210	$15,750	16,626	$752,742
1920	290	23,813	21,080	1,031,747
1921	145	5,604	18,277	465,894
1922	160	10,521	21,038	709,743
1923	139	10,663	27,096	1,138,637
1924	189	19,956	20,812	886,993
1925	151	14,526	12,211	679,956
1926	75	7,634	12,027	605,926
1927	168	12,803	7,953	330,185
1928	62	4,486	3,084	113,699
1929	-	-	8,562	340,228
1930	72	3,308	8,004	262,152
1931	-	-	1,951	46,749
1932	32	967	940	15,781
1933	128	5,433	2,106	54,914
1934	54	1,959	805	22,477
1935	78	3,777	963	26,790
1936	116	5,459	1,290	40,558
1937	179	10,710	2,129	92,222
1938	59	3,165	2,288	68,937
1939	13	421	1,914	62,384
1940	45	2,197	2,278	90,903
1941	51	3,151	5,459	278,197
1942	267	30,378	10,373	822,285
1943	316	39,540	9,199	978,527
1944	101	12,463	7,429	908,583
1945	125	17,513	5,839	773,669
Total	3,225	266,197	231,733	11,600,878

1/ See Carl Junction.

Mine production of lead and zinc concentrates in the Wentworth subdistrict, 1898-1945[1]

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1898-1905	-	-	-	-	-	-
1906	-	-	368	$16,359	-	-
1907	10	$737	629	23,760	79	$1,205
1908	-	19	317	10,606	327	6,624
1909	-	-	145	4,303	315	7,065
1910	-	-	46	1,848	162	3,866
1911[2]	-	-	485	19,885	8	191
1912	-	-	1,480	75,575	376	11,098
1913[3]	-	-	601	24,549	690	14,800
1914[3]	-	-	917	36,680	100	2,300
1915	-	-	1,091	86,980	562	25,243
1916	-	-	4,991	348,217	960	39,000
1917	10	1,100	6,250	380,088	293	10,894
1918[4]	-	-	3,110	150,765	-	-
1919	-	-	377	12,821	-	-
1920[4]	-	-	768	34,197	184	3,292
1921	-	-	548	10,334	-	-
1922	-	-	102	2,880	-	-
1923	[5]	[5]	[5]	[5]	[5]	[5]
1924	-	-	-	-	-	-
1925	-	-	43	2,408	-	-
1926-27	[6]	[6]	[6]	[6]	[6]	[6]
1928	-	-	973	34,663	-	-
1929-30	-	-	-	-	-	-
1931	[6]	[6]	[6]	[6]	[6]	[6]
1932	-	-	-	-	60	600
1933[7]	-	-	560	15,411	180	2,500
1934[7]	-	-	2,565	69,530	88	986
1935[7]	4	198	2,072	56,515	211	2,782
1936	-	-	84	2,041	-	-
1937[7]	319	20,688	776	29,610	-	-
1938[7]	517	26,400	2,215	66,779	-	-
1939	-	-	270	9,450	-	-
1940	-	-	424	16,324	79	2,133
1941[7]	-	-	7,242	359,542	-	-
1942	-	-	8,267	548,035	-	-
1943	3	199	3,630	313,463	-	-
1944	-	-	415	44,173	-	-
1945	-	-	465	58,382	-	-
Total[1]	863	49,341	52,226	2,866,173	4,674	134,579

[1] The Wentworth subdistrict began producing before 1898, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

[2] Barry County included.

[3] Stotts City included.

[4] Pierce City included.

[5] See Stark City.

[6] Included in Aurora.

[7] Diamond included.

Mine production of lead and zinc concentrates in the Zincite-Klondike-Smithfield subdistrict, 1898-1945 1/

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1898 2/	52	$2,581	1,881	$56,424
1899 2/	73	5,861	6,604	260,930
1900	180	8,810	9,386	283,751
1901	176	7,915	9,452	252,599
1902	205	9,480	7,503	248,885
1903	128	6,915	6,408	219,230
1904	133	7,060	3,985	150,700
1905	62	3,855	2,150	100,405
1906	43	3,380	1,592	71,558
1907	68	4,497	1,519	67,013
1908	22	1,138	1,869	69,184
1909	100	5,129	3,747	155,571
1910	153	7,769	3/ 2,647	111,262
1911	101	5,564	1,964	79,584
1912	65	3,498	4,716	265,144
1913	81	4,187	8,577	341,634
1914	103	4,560	3,921	147,048
1915	45	2,295	6,000	464,409
1916	139	9,618	7,278	573,128
1917	77	6,522	4,154	300,321
1918	50	4,298	1,068	56,021
1919 4/	16	1,035	459	19,300
1920-24	-	-	-	-
1925	5/	5/	5/	5/
1926	1,042	113,185	15,461	796,353
1927 6/	164	14,826	8,937	409,052
1928 7/	46	3,609	10,237	405,866
1929	1	96	2,969	128,355
1930-45	-	-	-	-
Total 1/ ...	3,325	247,683	134,484	6,033,727

1/ The Zincite-Klondike-Smithfield subdistrict began producing before 1898, but its output up to and including 1897 was not recorded separately from that of the county or district as a whole.

2/ Bellville.

3/ Includes 17 tons of silicate, carbonate.

4/ Cave Springs included.

5/ See Joplin.

6/ Includes Bellville.

7/ Includes Thoms Station.

8/ 1944 and 1945 production included in Carl Junction district.

Original from THE OHIO STATE UNIVERSITY

Mine production of lead and zinc concentrates in southwestern Missouri not distributed by subdistricts, 1898-1906

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1898	270	$13,400	683	$12,537
1899	925	48,700	5,032	181,814
1900	898	40,419	4,493	105,957
1901	639	28,718	3,963	96,813
1902	972	45,436	4,336	135,274
1903	696	37,990	6,602	232,090
1904	30	1,645	389	12,940
1905	14	800	673	27,175
1906	4	317	185	5,959
Total	4,448	217,425	26,356	810,559

Original from THE OHIO STATE UNIVERSITY

Kansas Subdistrict Production Tables

Mine production of lead and zinc concentrates in the Badger-Peacock subdistrict, 1904-45[1]

	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
Year	Short tons	Value	Short tons	Value
1904	88	$5,010	6,394	$276,165
1905	53	2,960	8,892	421,400
1906	43	3,266	14,100	642,299
1907	37	2,682	12,113	520,716
1908	514	27,515	10,353	355,795
1909	211	11,119	7,814	326,119
1910	526	29,262	6,286	259,658
1911[2]	134	6,902	2,517	92,726
1912[2]	166	8,502	2,094	102,847
1913	24	1,215	294	10,795
1914	-	-	-	-
1915	-	-	128	8,704
1916	11	987	1,043	86,634
1917	99	9,394	2,264	186,022
1918	234	21,192	1,041	59,999
1919	139	8,752	980	42,867
1920	723	73,675	1,884	76,958
1921	164	8,137	162	4,312
1922-24[3]	[3]	[3]	[3]	[3]
1925-36	-	-	-	-
1937	20	1,400	250	10,650
1938	10	550	290	8,700
1939	8	313	1,291	40,352
1940	-	-	-	-
1941	38	2,485	244	10,411
1942	-	-	-	-
1943	-	-	332	24,496
1944	6	626	592	56,566
1945	-	-	665	82,623
Total[1]	3,248	225,944	82,023	3,707,814

[1] The Badger-Peacock subdistrict began producing about 1898, but its output up to and including 1903 was not recorded separately from that of the State as a whole.

[2] Includes Lawton.

[3] See Crestline district.

Mine production of lead and zinc concentrates in the Baxter Springs, Blue Mound, Treece subdistrict, 1917-45

	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
Year	Short tons	Value	Short tons	Value
1917	1,005	$101,292	12,070	$849,351
1918	7,625	702,949	40,473	2,138,930
1919	13,522	925,346	76,470	3,403,032
1920	19,831	1,909,649	94,565	4,289,424
1921	22,346	1,208,035	52,762	1,194,616
1922	28,805	2,252,981	93,826	3,152,888
1923	22,023	2,139,263	169,945	6,925,479
1924	21,481	2,340,997	174,581	7,374,211
1925	27,051	3,218,604	200,043	10,494,327
1926	33,764	3,536,560	212,415	10,163,045
1927	32,080	2,837,962	187,239	7,469,739
1928	30,399	2,462,391	173,424	6,502,739
1929	30,046	2,584,202	188,294	7,664,656
1930	14,866	1,013,339	131,290	4,124,643
1931	7,560	329,164	70,577	1,578,727
1932	7,529	298,424	49,449	888,429
1933	7,482	344,723	76,846	2,066,251
1934	8,419	335,457	72,644	2,004,598
1935	13,925	564,622	98,796	2,869,450
1936	14,712	762,436	146,643	4,663,192
1937	20,460	1,451,140	147,944	6,324,267
1938	19,853	1,021,001	127,443	3,950,340
1939	17,232	974,651	121,221	4,137,450
1940	15,377	904,575	99,663	4,202,780
1941	18,835	1,260,664	122,582	6,148,373
1942	12,183	1,159,796	96,856	6,422,552
1943	12,117	1,459,848	97,852	9,812,267
1944	11,511	1,342,782	104,750	10,416,799
1945	8,621	1,112,696	77,646	8,381,526
Total ..	500,660	40,555,549	3,318,309	149,614,081

Mine production of lead and zinc concentrates in the Galena subdistrict, 1876-1945

	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
Year	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1876-98 1/	133,917	$5,666,606	2/	2/	584,340	$12,495,707	2/	2/
1899	6,723	354,311	2/	2/	64,708	2,313,831	2/	2/
1900	4,938	240,996	2/	2/	46,501	1,238,237	2/	2/
1901	5,238	245,881	2/	2/	33,998	797,844	2/	2/
1902	4,127	191,640	2/	2/	31,225	898,184	2/	2/

Mine production of lead and zinc concentrates in the Galena subdistrict, 1876-1945 (Cont'd.)

	Lead concentrates				Zinc concentrates			
	Galena		Carbonate		Sphalerite		Silicate, carbonate	
Year	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1903	3,139	$169,122	2/	2/	26,621	$878,943	2/	2/
1904	3,546	197,860	2/	2/	22,852	800,155	2/	2/
1905	2,547	160,760	2/	2/	21,113	948,820	2/	2/
1906	4,190	324,985	2/	2/	29,053	1,226,591	2/	2/
1907	3,138	178,979	8	$303	23,498	914,382	94	$489
1908	2,647	140,428	-	-	17,925	569,371	395	4,414
1909	1,466	70,461	-	-	14,934	555,169	503	8,215
1910	2,447	115,022	61	2,496	20,848	738,561	106	1,452
1911	3,487	190,950	-	-	17,770	641,422	122	2,916
1912	2,837	150,296	33	1,335	19,164	902,662	125	3,152
1913	3,041	154,718	2	43	16,340	638,873	198	3,194
1914	1,701	75,376	-	-	15,065	566,173	38	623
1915	1,581	83,083	-	-	22,000	1,490,822	71	2,522
1916	2,136	155,389	-	-	19,448	1,447,323	5	196
1917	2,709	246,163	-	-	18,774	1,229,725	21	930
1918	1,189	98,568	4	264	6,635	279,670	-	-
1919	331	20,714	-	-	1,506	55,005	-	-
1920	277	22,193	-	-	922	45,915	-	-
1921	17	850	-	-	-	-	-	-
1922	174	11,650	-	-	110	4,255	-	-
1923	128	9,313	26	1,809	489	20,594	-	-
1924	379	38,519	113	9,295	39	1,307	-	-
1925	592	64,880	142	12,171	409	21,885	38	1,170
1926	292	27,504	198	15,603	574	24,438	-	-
1927	207	16,066	154	9,240	140	4,700	-	-
1928	311	22,581	106	6,360	836	31,935	-	-
1929	204	14,761	102	6,258	229	8,409	-	-
1930	165	9,071	63	3,365	15	367	-	-
1931	354	11,897	270	8,581	1	13	-	-
1932	547	17,728	79	1,772	27	450	-	-
1933	120	3,758	80	2,542	-	-	-	-
1934	100	3,736	100	2,764	-	-	-	-
1935	310	12,400	-	-	70	1,500	-	-
1936	62	2,658	-	-	178	5,316	-	-
1937	70	1,414	-	-	615	27,094	-	-
1938	10	500	-	-	41	1,200	-	-
1939	561	32,500	-	-	-	-	-	-
1940	-	-	-	-	-	-	-	-
1941	-	-	-	-	219	10,512	-	-
1942	65	7,042	-	-	1,278	101,405	-	-
1943	115	12,574	-	-	2,754	356,633	-	-
1944	658	75,289	-	-	5,810	598,783	-	-
1945	1,280	114,224	-	-	4,124	452,180	-	-
Total .	204,073	9,765,416	1,541	84,201	1,093,198	33,346,361	1,716	29,273

1/ See summary table Kansas for production by years, 1876-98.

2/ Carbonate and silicate included with galena and sphalerite.

Mine production of lead and zinc concentrates in the Lawton-Waco subdistrict, 1911-45

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1911-12[1] ..	-	-	-	-
1913	37	$2,086	3,399	$143,366
1914	107	4,600	6,747	264,003
1915	37	2,332	5,625	424,445
1916	70	5,727	3,786	290,112
1917	116	12,138	5,658	408,070
1918	31	2,730	7,830	459,045
1919	32	2,609	9,000	400,356
1920	-	-	15,777	742,275
1921	152	6,895	15,526	386,123
1922	152	9,880	10,200	337,980
1923	36	2,700	19,934	814,016
1924	234	23,996	24,598	1,099,679
1925	72	7,766	21,905	1,200,750
1926	15	1,419	21,710	1,076,378
1927	-	-	17,669	720,166
1928	-	-	23,072	897,008
1929	-	-	14,787	577,800
1930	-	-	8,497	251,882
1931	-	-	2,063	49,513
1932-33	-	-	-	-
1934	-	-	83	2,207
1935	16	668	3,122	75,059
1936	15	652	2,274	66,949
1937	9	553	2,837	114,053
1938	36	1,800	5,772	172,008
1939	44	2,642	3,723	122,563
1940	47	2,721	5,407	217,580
1941	15	998	8,361	426,210
1942	5	464	5,113	402,788
1943	11	1,469	4,718	599,187
1944	1	84	6,675	887,169
1945	66	9,402	6,870	798,942
Total	1,356	106,331	292,738	14,427,682

[1] Included in Badger-Peacock.

Mine production of lead and zinc concentrates in the Playter (1906-09) and Crestline (1922-45) subdistricts

Year and subdistrict	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
Playter:				
1906	4	$250	80	$3,195
1907	17	942	260	9,625
1908	44	2,284	246	7,480
1909	3	148	92	2,995
Total	68	3,624	678	23,295
Crestline:				
1922 1/	305	25,599	83	2,907
1923 1/	400	34,807	86	3,225
1924 1/	1,681	180,478	409	13,256
1925	1,623	194,258	5,988	316,255
1926	2,495	269,277	8,408	412,395
1927	3,181	277,323	6,640	246,535
1928	1,601	128,598	7,000	249,280
1929	4,041	356,555	6,943	300,318
1930	1,841	118,044	3,546	103,680
1931	1,099	54,589	1,049	23,739
1932	224	9,420	11	187
1933	150	5,500	400	11,000
1934	115	4,600	135	3,700
1935	50	2,000	90	2,500
1936-45	-	-	-	-
Total	18,806	1,661,048	40,788	1,688,977

1/ Includes Badger-Peacock.

Oklahoma Subdistrict Production Tables

Mine production of lead and zinc concentrates in the Miami-Cardin-Commerce-Douthat-Hockerville-Picher-Quapaw subdistrict, 1904-45

Year	Lead concentrates (galena)		Zinc concentrates (sphalerite)	
	Short tons	Value	Short tons	Value
1904	150	$8,250	633	$21,245
1905	566	34,450	2,670	103,480
1906	669	51,299	3,242	124,528
1907	647	43,644	1/3,159	120,071
1908	2,234	118,253	1/10,033	249,674
1909	4,300	223,131	1/16,622	569,200
1910	3,634	187,861	13,976	447,043
1911	3,177	170,729	1/10,642	330,186
1912	4,257	231,678	1/11,881	484,429
1913	7,807	402,927	24,097	766,200
1914	9,402	443,543	1/28,367	926,778
1915	9,058	494,524	28,280	1,901,490
1916	15,206	1,275,761	54,932	4,109,565
1917	32,765	3,300,634	159,656	10,762,324
1918	69,862	6,186,131	300,702	15,182,135
1919	67,768	4,598,760	336,948	14,489,402
1920	81,454	7,651,252	407,569	18,320,875
1921	52,234	2,741,010	225,569	5,150,154
1922	79,705	5,987,561	389,144	13,375,413
1923	85,473	8,115,798	463,090	18,731,194
1924	91,882	9,801,526	516,228	21,127,909
1925	103,359	12,106,094	549,211	27,809,581
1926	90,597	9,690,059	531,613	24,404,099
1927	67,444	5,852,023	404,208	15,475,646
1928	56,839	4,591,975	354,071	12,852,797
1929	61,041	5,103,629	374,077	14,426,962
1930	30,626	1,980,922	263,169	7,919,524
1931	17,005	786,719	148,112	3,540,964
1932	13,601	467,291	118,276	2,177,934
1933	23,338	1,033,575	172,095	4,441,772
1934	21,804	848,123	204,223	5,523,186
1935	30,790	1,329,656	246,131	7,047,052
1936	34,833	1,735,732	244,740	7,628,448
1937	39,446	2,729,690	255,839	10,428,354
1938	27,608	1,446,058	208,484	6,390,422
1939	36,422	2,189,077	258,214	8,937,554
1940	27,913	1,656,497	300,984	12,672,186
1941	32,628	2,202,876	307,207	15,427,235
1942	29,759	2,981,443	272,187	19,162,729
1943	26,419	3,208,429	213,128	21,249,309
1944	18,441	2,256,554	170,470	18,067,967
1945	17,192	2,097,293	128,934	14,021,165
Total	1,429,355	118,362,437	8,732,813	386,898,181

1/ Includes a small quantity of silicate and carbonate.

Mine production of lead and zinc concentrates in the Peoria subdistrict, 1891-1945

Year	Lead concentrates (galena)		Zinc concentrates			
			Sphalerite		Silicate, carbonate	
	Short tons	Value	Short tons	Value	Short tons	Value
1891-1903 1/ ..	1,636	$72,597	12	$376	451	$4,856
1904-06	-	-	-	-	-	-
1907	2/20	1,402	14	568	553	14,036
1908	2	80	24	617	261	6,325
1909	6	246	-	-	267	7,348
1910	2/ 4	202	-	-	65	1,406
1911	12	628	-	-	311	8,330
1912	-	-	-	-	90	2,500
1913	3	170	6	192	67	1,340
1914	-	-	-	-	6	100
1915	2/211	11,845	-	-	172	5,666
1916	2/138	8,028	41	2,513	312	14,886
1917	10	900	-	-	124	4,931
1918	50	4,300	-	-	25	646
1919	62	4,760	123	5,160	20	600
1920	10	800	-	-	14	462
1921	2	100	-	-	-	-
1922	11	925	-	-	50	450
1923	1	70	-	-	54	520
1924-25	-	-	-	-	-	-
1926	28	2,110	-	-	82	2,065
1927	-	-	-	-	20	320
1928-31	-	-	-	-	-	-
1932	48	1,600	-	-	-	-
1933	300	13,000	-	-	116	2,082
1934	85	3,400	-	-	60	780
1935-41	-	-	-	-	-	-
1942	35	3,842	-	-	22	893
1943	4	456	-	-	58	1,727
1944	14	1,634	-	-	-	-
1945 3/	6	659	-	-	-	-
Total	2,698	133,754	220	9,426	3,200	82,269

1/ Data incomplete.
2/ Includes a small quantity of lead carbonate.
3/ No production 1935-41.

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